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Canadian Mammals.

CANADIAN MAMMALS

BY AUSTIN W. CAMERON

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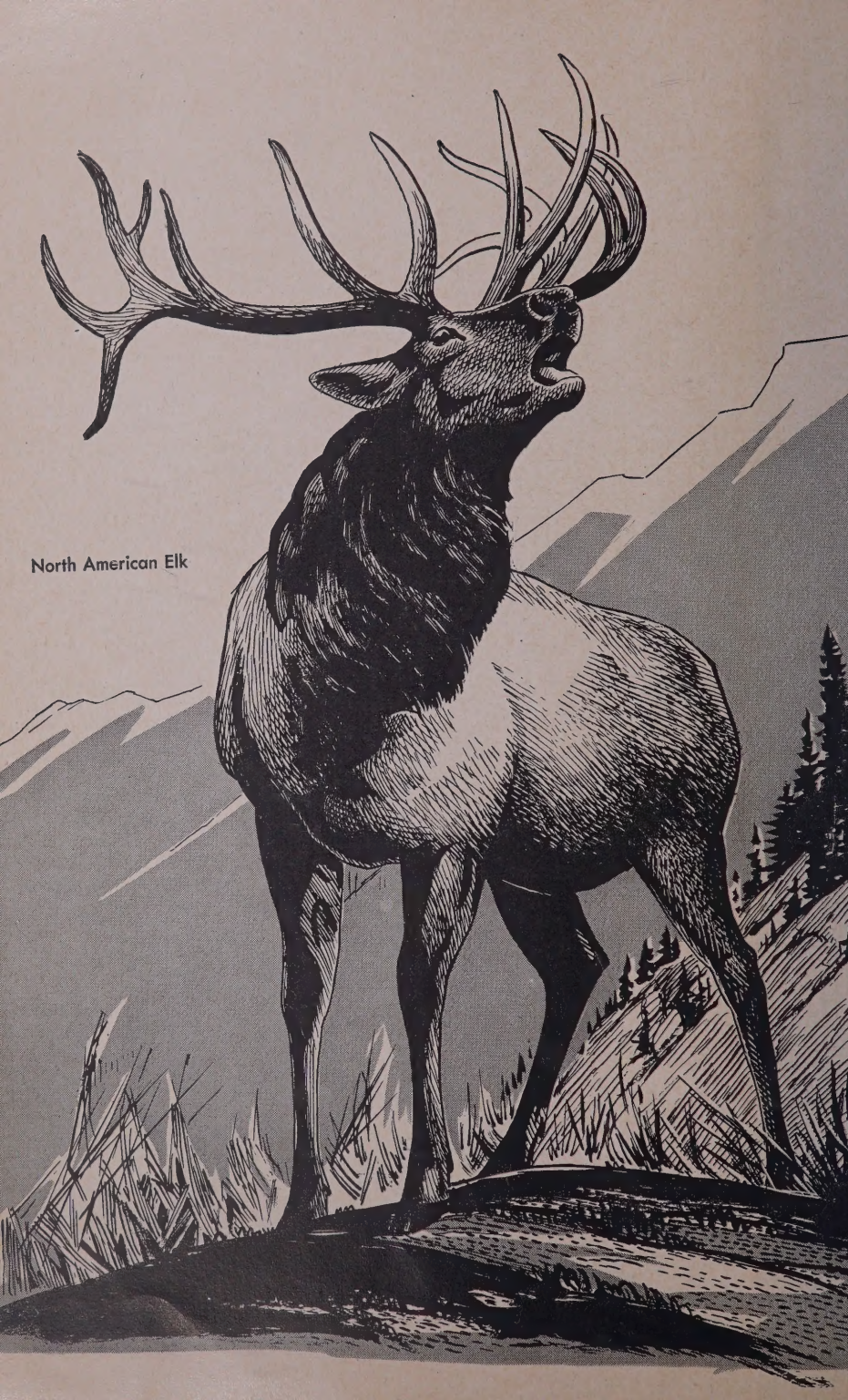

North American Elk

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Canadian Mammals

By
Austin W. Cameron

Illustrations by John Crosby

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CANADIAN MAMMALS

INTRODUCTION

The term "mammal" has never gained popular acceptance, and many people do not know what a mammal really is nor how it differs from other living things. If we were to say that a mammal is what most people would simply call an "animal," no further explanation would be necessary. Unfortunately, biologists apply the term "animal" to all living things except plants. This term, therefore, is also correctly applied to birds, amphibians, reptiles, fish, insects, worms, and protozoans, to name only a few.

By definition, a mammal is an animal "that has a body covering of hair at some time during its life-history and nurses its young with milk." Most mammals, of course, bear their young alive, although the duckbill platypus and the Australian ant-eater are egg-layers and are the exceptions. There are, of course, many other characteristics peculiar to the group that cannot be discussed here.

Although all living things have a certain fascination, probably no single group can claim such popular appeal as the mammals. Perhaps this is only natural since man himself is a mammal, and so are most of his domestic animals. The close association between man and other mammals extends far into the past. Before the dawn of history, primitive man was often in danger of the larger beasts, many of which he was obliged to kill for food. Gradually he learned that some of these could be tamed, and he eventually became a herder, rather than a mere hunter dependent on chance encounters with wild animals. Later, when he learned to till the soil and grow his own plant food, he used his domestic animals to draw the plow. Throughout the history of early man, mammals have played a most important

role, and today many species are being domesticated for use in medical research or merely to satisfy our desire for new and exciting pets. While we do know how many species of mammals were domesticated, some of the more familiar ones, such as the horse, cow, pig, and dog, were tamed so long ago that we know little or nothing of their origin or how early man contrived to domesticate them. Indeed, if man had not domesticated and preserved the horse, it would now be extinct.

Today we have little to fear from wild animals, and except for certain primitive tribes in the tropics and in the Far North, man is no longer dependent on them for food. Nevertheless, wild animals still fascinate us, and the sight of one in its native environment is always a thrilling experience. Who would miss the opportunity to catch a glimpse of a moose wading in a wilderness lake or a black bear fishing salmon in a forest pool? Even a common red squirrel burying a nut or a mother skunk with her train of black-and-white youngsters is pleasantly diverting.

As there are more species of mammals in Canada than can be discussed in this brief booklet, the selection was based on the interests of the average reader who is not concerned with obscure species or with those of a very restricted distribution. Undoubtedly every reader would like to see all the species in our vast country discussed, and we regret that space does not allow such treatment.

North American Elk

The North American elk or wapiti is one of the most sociable of our antlered mammals and in this respect is exceeded only by the caribou. Bands consort together throughout most of the year, and especially large concentrations occur during the winter months. As the older bulls keep apart in bands of their own, most groups consist of cows, calves, and young bulls. During the rut, however, the bands break up, and the older bulls herd the females into harems.

The adult bull elk with his immense cylindrical antlers has a noble bearing and is perhaps the most striking of all members of the deer family. The moose and the caribou are not so well proportioned.

Adult elk are a plain wood brown with large white rump patches — often the only part visible at a distance. Bulls weigh about 700 pounds, and females about 500.

Elk tend to be migratory, and if both mountains and lowlands are within their range, they ascend to higher elevations for the summer and descend to the plains and valleys with the coming of winter. In farming or ranching areas, they compete with range cattle for food and have thereby earned the disfavour of cattlemen. Unlike deer and moose they are grazers rather than browsers and are more abundant on the plains than in the woodlands.

The single calf (occasionally two) is born in May and June after a gestation period of from 249 to 262 days. Like the young of most deer, the calf is spotted at birth, and the spots are still evident in early autumn when the summer coat is replaced by a heavier one for winter.

The rut occurs in September and October, and during this period each adult bull herds together as many cows as he can persuade to join a harem. There may be some opposition from other bulls, particularly the younger ones that do not get a chance to participate. On such occasions, there are regal battles in which the rival bulls meet head-on, their antlers clash with resounding reverberation, and sometimes a tine pierces the flank of an opponent or part of an antler gets broken.

Elk, except when very young, are largely immune from predators, but parasites and disease take their toll, and in unusually hard winters many succumb to starvation.

This magnificent animal is common in many parts of the Canadian west, especially in the National Parks. Given a certain measure of protection, it thrives and increases rapidly. In fact, in some refuges the population has reached such proportions that it has been necessary to kill off a number each year.

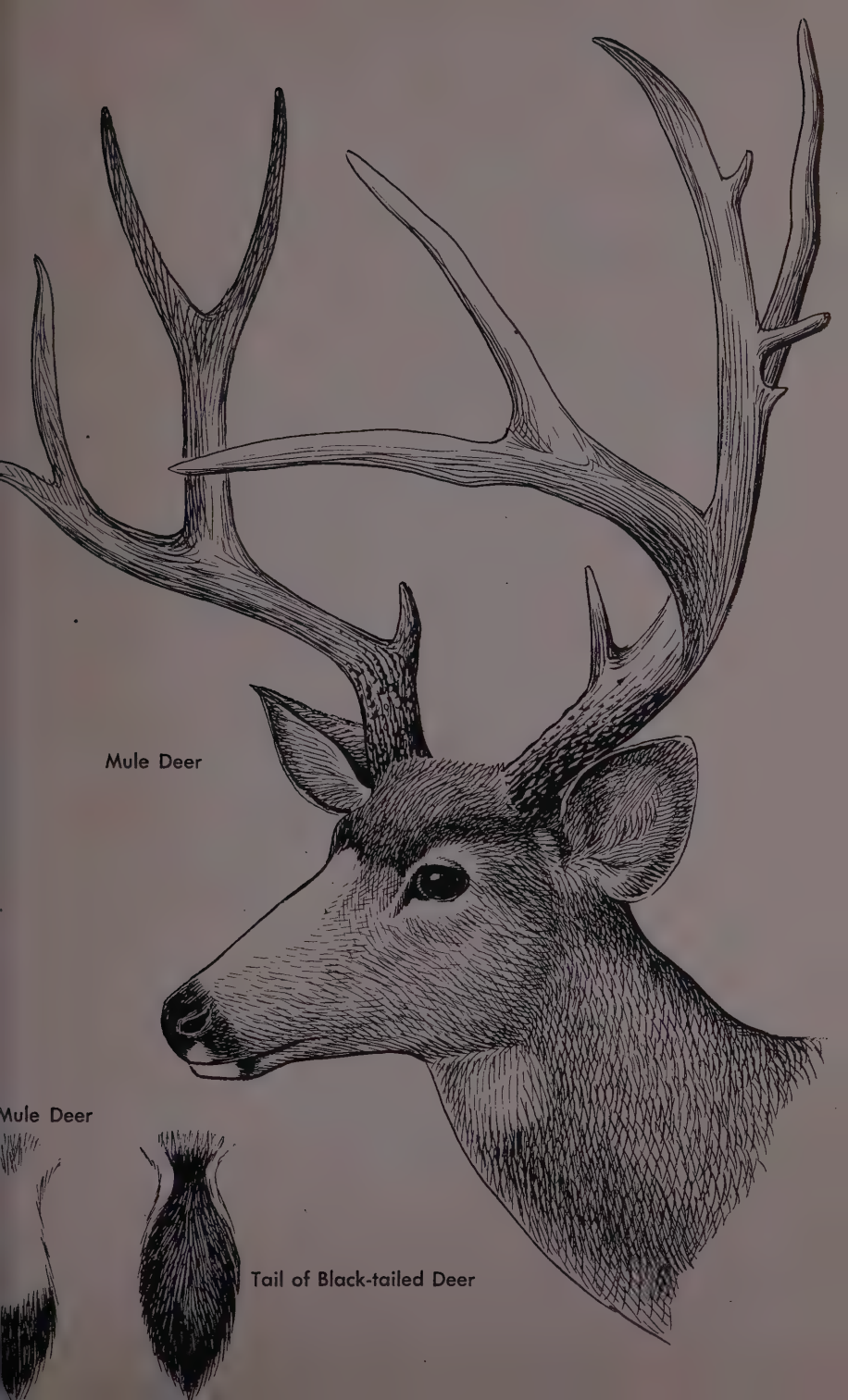
Mule and Black-Tailed Deer

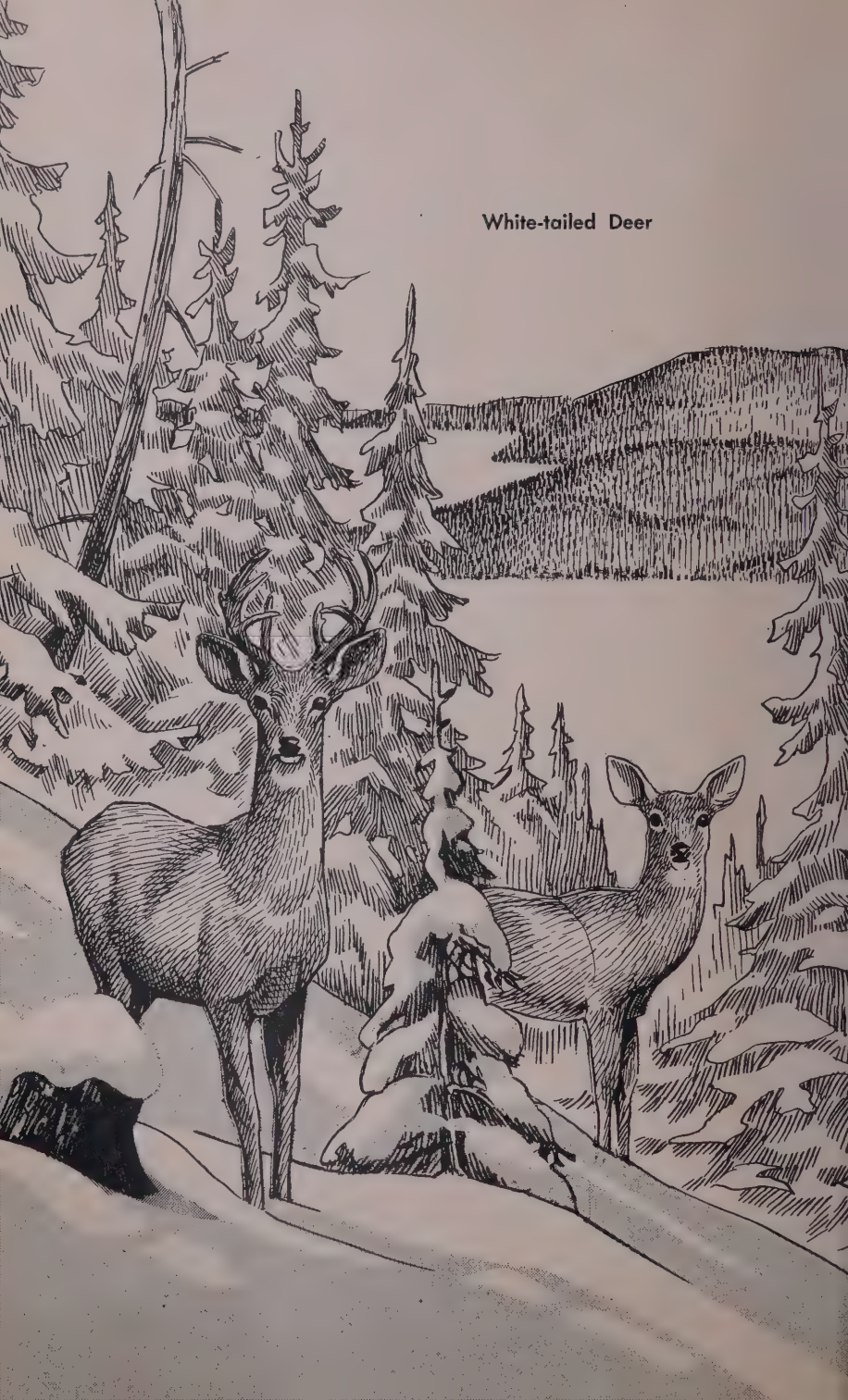
The mule deer and the black-tailed deer of western North America, because of the difference in their size and colour, were once thought to be distinct species. We now know that they are merely subspecies or varieties of a single species.

The mule deer by its forked antlers can be readily distinguished from the white-tail of central and eastern Canada. A short distance about the crown, the main beam branches to form two equal tines, which in turn fork to form additional tines. By contrast, the antlers of the white-tail consist of a single large beam from which spring several tines that curve more or less forward. The mule deer is a heavier, stockier animal than the white-tail, and its coat is greyer. The mule deer also has larger ears, hence the name. The typical mule deer has a large white rump patch with a rounded white tail, while the black-tail deer has a very restricted rump patch and the tail is black above.

As the mule deer and the black-tailed deer are more sociable than the white-tailed, they usually occur in small bands. During the rut, which occurs in late autumn, the buck may round up three or four does into a harem. The one to three (usually twins) fawns are born in June or July, later than the young of the white-tail.

Essentially browsers, these deer feed on the tender twigs and shoots of a wide variety of trees and shrubs. They also eat grass and herbs. In some areas, they tend to be quite migratory, especially in mountainous regions where they move up the slopes in the spring and descend in the autumn.


Mule Deer
Mule Deer
Tail of Black-tailed Deer


White-tailed Deer

White-Tailed Deer

The white-tailed deer, by far the most abundant of our antlered mammals, has a wider range in North America than any other related species. Most large mammals decrease in numbers or disappear as man invades their domain, but in many respects, the white-tailed benefits from agricultural and lumbering activities. He prefers second-growth woods and the shrubbery borders of farmlands and requires less territory in which to live than most large mammals. As a result, there may be as many as four deer to the square mile.

These deer generally rest during the day in a thicket and set forth on their forays at dusk. Moving slowly along the woodland trails, they sample the tender twigs and shoots of a wide variety of trees and shrubs. Among coniferous trees, cedar is a favourite, and in summertime they eat not only grass, but some fungi that are poisonous to man. After they have had their fill, they often lie down during the night for a short period, but become active again before dawn. In parks and game reserves, however, where they are unmolested, they are frequently seen during the day.

The antlers of the male, which are grown each year, are among the most remarkable structures in the animal world. They are actually fast-growing bones, which start as simple knobs and reach a length of a foot or more within a few months. During the growing period, a thin skin known as the "velvet", which is well-supplied with nerves and blood vessels, covers the antlers. In late October, when the antlers attain full development, the blood vessels and nerves cease to function and the velvet dries up. It evidently becomes very itchy at this time, because the buck rubs his antlers against trees and bushes and it comes off in long, shaggy strips. By early November the velvet has been completely removed, and the antlers are clean and polished.

November is the mating or "rutting" season of this deer, and the buck travels widely in search of does. Should he meet with a buck with similar intent, a battle often ensues. Meeting head on, each attempts to overcome his adversary by prodding him with his

antlers. Although serious injury rarely results, the antlers occasionally interlock and the animals die of starvation.

By early December the rut is over, and shortly thereafter the antlers are shed and the bucks lose their fighting spirit. Throughout the autumn, the thin, reddish-brown summer coat has been gradually replaced by a thicker blue-grey coat, a protection often sorely needed in the colder parts of the deer's range.

In winter, especially during periods of deep snows, the deer "yard up." Bands of does, bucks, and fawns congregate where they can find both food and shelter within a small area. When the snow disappears, the band disperses. The does, with their fawns of the previous year, may stay together, but the bucks go their separate ways.

After a gestation period of about seven months, the older does give birth to twin fawns in May or June, but the young does have a single fawn in June or even early July.

The fawns remain for two weeks or more in the thicket in which they are born. While the doe is absent in search of food, the fawns lie flat and motionless, rarely moving even in the presence of an enemy. Their bright reddish-brown coats are dappled with white spots and closely resemble the brown earth flecked with patches of sunlight. Their tiny bodies blend so perfectly with their surroundings that even at close range they are almost invisible.

Despite the large numbers shot by hunters each year and killed by parasites, disease, and unfavourable weather, the deer population is still too high in most areas, particularly in the East. Over-abundance means less food and greater hardship, especially during the winter months.

Moose

Aptly named "King of the Forest," the moose has a regal bearing unmatched by any other wild mammal. Giant-like among the antlered tribe, his massive antlers bespeak the brute strength and savage power that make him the undisputed master of his domain.

In the depths of the wilderness where the virgin forest is broken only by lonely lakes and desolate muskegs, the moose is truly at home. In winter he ranges on the hilly slopes to browse on the tender twigs of maples, ground hemlock, and other forage, while in summer he descends to the lake margins where water-lilies grow in abundance. Along the edges of the lakes or in muskegs, new shoots sprout forth in spring and summer, and food is abundant in an almost endless variety.

The moose is not a particularly sociable animal, and the old bulls spend most of their lives wandering alone over their private territories. The cows may consort with their calves of the previous year, but the family ties are never strong and the animals soon go their separate ways. In winter, several moose may yard together, perhaps more for convenience than companionship.

October is the rutting season, and many a battle is fought for the favour of an unclaimed cow. There are many legends and stories told by trappers and woodsmen about the battles waged by the bull moose during the rut. The surrounding woods echo with the sound of the impact as the two giants meet in head-on combat — the very ground quivers beneath their hoofs, as each strives to unbalance his opponent. Sometimes, with a sharp cracking sound, an antler is splintered or the entire antler dislodged. There is rarely serious injury, but at times the rivals go their separate ways bearing the scars of battle. Whether the cow accepts the victor is not known, but she probably does, as the vanquished generally beats a hasty retreat to another part of the country to nurse his wounds.

Since early spring, the bull has been growing his crowning glory, the immense pair of antlers that will be needed during the rut to fortify his demands for a certain cow in case of competition. Throughout the growing period they are covered by skin known as the "velvet," which

Moose

provides nourishment. By September the antlers have attained full development, and the velvet dries up and ceases to function. The bull then rubs it off, and it hangs in ribbon-like strips. By the time the rut is under way, the antlers are smooth and hard and capable of withstanding the force of a head-on collision with an opponent. After the rut is over, the connection between the antler and skull weakens, and the antlers drop off of their own accord or are knocked off by striking some object.

Eight months after the rut, usually in May, the calves are born. Unlike the young of many members of the deer family, they are unspotted at birth. Twins are the rule, but sometimes only a single calf is born, and rarely three. The cow chooses for a nursery a secluded spot near favourable feeding grounds so that she rarely has to travel far from her youngsters. When the calves are several weeks old, they are ready to go on short forays with their mother in search of food.

The advance of civilization has not been kind to the moose, for the woodsman has invaded his wilderness home and in many cases the plowman. Sportsmen have come in to hunt, and he is an easy quarry because he rarely flees when he sights a potential enemy. Before the coming of the white man with his firearms, he had little to fear from any animal and therefore no reason to hide. Only through careful conservation measures can this magnificent mammal be preserved for the future.

Caribou

The caribou is the most widely distributed of our hoofed mammals, ranging from the trackless wastes of the northern tundra to the bog wilderness of our southern forests, and from the barren hills of Newfoundland in the east to the slopes of our western mountains. The most spectacular of the entire tribe are the barren-ground caribou of the Northwest Territories which migrate in immense herds from the shores of the Arctic sea to the northern edge of the woodlands along the boundaries of the Prairie Provinces. Across the muskeg, over the naked hills and the quaking bogs moves a seemingly endless column of brown bodies, surmounted by racks of antlers like a forest of dead branches.

Both male and female caribou have antlers, but those of the male are larger and have more spikes or "tines." Each winter they are shed, to be renewed with the coming of spring. The bulls generally shed their adornments in early winter, while the cows retain theirs until spring.

Two general groups of caribou are recognized by zoologists: the woodland caribou of the evergreen forest and the barren-ground caribou of the North and West. Those of the woodland group are larger and darker, and consort in smaller bands, generally in areas of muskeg. The small barren-ground caribou are much more migratory and, as already mentioned, may roam in herds consisting of thousands.

Lichens are the staple food of these animals, and much of the wandering is due to the fact that these plants are slow growing and the caribou must constantly seek new pastures.

Since caribou are always on the move, the females have no opportunity to make special provisions for their young who are, as a consequence, born anywhere on the barrens or on the muskeg. At birth, these youngsters are well-developed and are strong enough to accompany the herd.

The rutting season comes in September and October. By this time the antlers of the bull are fully grown, and the beams and tines

Caribou

have been rubbed clean of their velvet. He is not content with a single cow but endeavours to collect as large a harem as possible. Indeed, so much of his time is taken up with this task that he has little opportunity to eat or rest and consequently is run-down and thin when the rut is over. Almost 240 days after mating, the single uniformly coloured fawn is born. Twins are rare.

In the economy of the Indians and Eskimos of the North, caribou, which provides both food and clothing, is very important. Many communities depend on the annual migrations to obtain their food supplies, and if the caribou fail to arrive, as they sometimes do, the natives are faced with starvation. It is for this reason that the Canadian Government is so interested in its conservation.

Pronghorn Antelope

Pronghorn Antelope

The pronghorn in many ways is a peculiar mammal. Though not closely related to the true antelopes of the Old World, despite its common name, it belongs to a family group of its own. The horns of this antelope are most unusual because the outer covering, or sheath, is shed each year, while the horn-core is retained throughout life. Both sexes are horned.

The open plains, especially the arid sage-brush country of our southern Prairie Provinces, are the haunts of the pronghorn, which travels in loose bands, moving generally from the river bottoms, where they come to drink, to the adjacent grassy uplands to feed.

During the rut the bucks herd the females into harems, and a good deal of fighting takes place between rival males. The gestation period is of about 240 days' duration, and twins are the rule. Although small at birth, the young pronghorn, known as the kid, develops very quickly and can follow the herd when only three or four days old. Coyotes are the chief enemy of the kids, and the doe is very careful to protect them during the first few weeks of life. Death among adults is more likely to be caused by parasites or disease than by predators.

When seen on the treeless plains, the pronghorn appears to be quite a large mammal, though in reality it is smaller than any of our deer. Full-grown bucks average about 120 pounds, while the does weigh less than 100 pounds.

The colour pattern of these animals is quite striking for a hoofed animal. The background colour is a rich fawn with broad, white rump patches, white underparts, and white areas on the neck and head. The buck has a white head with black stripes under the chin, on the face, and behind the ears. The female has much less black on the face.

Although pronghorns are now reasonably abundant in restricted areas on the plains, their numbers were greatly reduced when ranchers moved into the region. By establishing refuges, the population has gradually increased, and in some areas the pronghorn is now abundant.

North American Buffalo

The North American buffalo or bison is truly the wild ox of North America. In many respects he resembles the domestic ox but is considerably larger and has a longer coat and higher, more massive shoulders. In temperament, too, he is similar to domestic cattle, but a large bison weighing more than a ton is far more dangerous than his domestic counterpart.

Originally, buffalo roamed over most of the Great Plains from Great Slave Lake south to New Mexico and Florida and from Pennsylvania west to the foothills of the Rockies. When the first white men reached the Great Plains, there was an estimated sixty million buffalo on the continent — probably the most abundant big-game animal that has existed within historic time. Such a huge population is not surprising, as they had thousands of square miles of territory and few enemies. Before the advent of Europeans, the sparsely scattered bands of Plains Indians killed only enough for their immediate needs, and the wolves destroyed but a few calves.

The arrival of the white man with his modern firearms was a turning point in the history of the buffalo. Long-range rifles and swift-footed horses gave the Indians and the whites a distinct advantage over the lumbering bison, and these combined factors almost sealed the fate of this magnificent animal. Against spears and arrows he was relatively secure, and his vicious temper and gigantic size threw fear into the hearts of his enemies, but the gun changed all that — now hunters could kill at their leisure in comparative safety.

The wholesale slaughter of the buffalo is one of the most gruesome episodes in the history of American wildlife. Thousands were killed for their tongues and hides alone — the rest was usually left to the coyotes and vultures, the carrion beetles and the scavengers. It was indeed rare for hunters to utilize an entire carcass.

Despite the wholesale destruction that was going on throughout the length and breadth of the plains, no effort was made to conserve the bison. In fact, many maintained that buffalo were increasing,

American Buffalo

rather than decreasing, in the areas where they were most persistently hunted.

The passage of time, however, soon disclosed the fallacy of this belief. By 1900 the original population of over sixty million had been reduced to a few hundred. Had it not been for the protection that they enjoyed on certain ranches and the safety afforded by a few wilderness areas, even these would have been exterminated.

About the year 1900, naturalists and others in Canada and the United States became uneasy about the future of the buffalo and asked their respective governments to set up refuges where these wild cattle could live unmolested. In 1925 the Canadian Government released a few animals in Wood Buffalo Park, and they did so well under protection that they soon increased out of all proportion to the size of their refuge. As a result, other protected areas had to be established. Officials of the National Parks of Canada estimated that the total number of buffalo in the Canadian Parks in 1950 exceeded 13,000.

The buffalo is a sociable animal and prefers to live in large herds. Most bands consist of cows, bulls, and calves of various ages. Usually, the leader is an old female who is probably familiar with the best feeding grounds and the most convenient routes for travel. Although most bison are attached to one herd or another, there are usually a few hermits that prefer to live alone. Sometimes, a few bachelor bulls, perhaps driven off by larger and stronger males, will form a small band of their own.

To the average observer, the bison appears to be a rather stupid and inoffensive creature, but when angered he is one of the most ferocious and dangerous of wild animals. They are also very unpredictable, and often the slightest disturbance will cause a whole herd to stampede. One minute a herd is grazing as peacefully as a group of domestic cows in a pasture; the next, they are a raging inferno of flying hoofs and horns, and anything that is in their path is likely to be trampled or gored to death. For some unknown reason they have a strong dislike for horses and will charge one on sight.

Midsummer is the bison's mating season, and each male tries to acquire as large a harem of cows as possible. Sometimes two bulls

will fight over an unclaimed cow, and the struggle may last for hours until one is injured or both are completely exhausted. Strangely enough the cow usually shows no indication of concern over the battle and sometimes wanders off with a third bull that may be close at hand.

In May, each cow gives birth to a single calf (rarely twins), which is strong enough to follow her about when only a few days old. He looks much like a large reddish-brown domestic calf but is of stockier build and has a shorter neck. Like all young animals he is very playful, and in any herd one may see groups of them frolicking about, kicking and butting one another. He grows very quickly, and the growing horns appear as tiny bumps when he is only about 2 months old. Full growth, however, is not reached until he is about 8 years old.

While they are growing up, the calves are protected by the entire herd. When attacked by wolves, the herd forms a small compact group with the cows and calves in the centre and the bulls on the outside.

In the early days, the buffalo provided the Plains Indians with their chief source of food. The meat was dried as pemmican for winter use, and the tough hides were used as tent coverings and for articles of clothing. Armed with only bows and arrows and other simple weapons, the Indians braved great dangers in hunting the bison. In many cases they constructed corrals into which the bison could be driven for the slaughter. The early European settlers were also very dependent upon the buffalo for food, without which the settling of the prairies would have been almost impossible.

The buffalo has played such an important role in Canada's history that it has become a national institution. He appears on more national and provincial seals and emblems than any other wild animal, with the possible exception of the beaver. In museums, zoos, and parks he is always a favourite object of interest to thousands of spectators annually.

Muskox

The muskox is a stocky, long-haired animal that somewhat resembles the domestic ox. His down-curved horns and woolly underfur, however, suggest a relationship to the wild sheep. It was once believed that he represented the "missing link" between the sheep and the domestic cow, and early biologists gave him the name *Ovibos,* which is Latin for "sheep-cow." Recent research has shown, however, that he is not closely related to either of these animals but belongs to an entirely different group.

The muskox is so-called because of the musky odour he emits when excited or annoyed. This scent is produced by numerous small glands distributed over his body.

A native of the Arctic regions, this northern ox shares his bleak and rugged homeland with the Arctic hare, the white fox, and the polar bear. Unlike the northern caribou which migrates south to the timberlands each autumn, the muskox spends his entire life on the frozen tundra. Plodding slowly over the tractless muskegs and rocky hillocks, he searches for the dwarf arctic plants — the sedges and grasses, saxifrages and horsetails, stunted birches and willows. When drifting snows cover the vegetation in the valleys, he must either paw away the frozen crust to secure his food or move to the bare, wind-swept hillsides. Despite all these handicaps, muskoxen have thrived for thousands of years, and remains dating back as far as the Ice Age have been unearthed.

Because of its large size and the inhospitable nature of his homeland, the muskox has fewer enemies than most southern species. Nevertheless, many blood-sucking mosquitoes and black flies swarm over the muskegs in summer, and packs of hungry wolves follow the wandering herds at all times of the year.

When pursued by wolves, the muskox does not take flight as do caribou and many other animals. As soon as the howling pack is sighted, the muskoxen form a small, tightly packed group with the females and calves in the centre and the bulls on the outside. Thus the advancing wolves find themselves confronted by a living wall of bristling horns. Faced with such a fearsome spectacle, the wolves

Muskox

usually hesitate in the hope that an unwary calf will break through the ring and run out into the open. Should the wolves come too close to the herd, an enraged bull is likely to charge and trample or gore them to death in a matter of seconds.

Summer is the mating season, and each bull is busily engaged in rounding up as many cows as possible for his harem. As more and more females join one harem or another, the competition for unclaimed females becomes very keen, and often royal battles ensue between rival males. Facing each other at some distance, they snort and paw the ground as the tension mounts. Then, overcome with rage, they rush at one another with lowered heads and meet in a head-on collision. The ground seems to quiver as the two monsters clash. The struggle usually continues until one or the other is vanquished. Whether the female accepts the winner has never been determined.

In April or May the single calf (rarely twins) is born into a bleak, uninviting world. The Arctic winter is not yet over, and his short coat of hair is little enough protection against the howling blizzards that sweep off the polar sea. Unlike the domesticated calf, the baby muskox is not awkward and ungainly but is well proportioned, with short stubby legs and a rather large head. At birth he weighs about 20 pounds and is less than 2 feet high at the shoulder. Before winter sets in, however, he is almost half grown, and at 3 or 4 years of age he may stand 5 feet at the shoulders and weigh almost half a ton.

When the first explorers reached the Canadian north, they found bands of muskoxen distributed over most of the continental barrens and Arctic Islands. Since then, their numbers have been greatly reduced, and the Canadian Government has found it necessary to declare a continued closed season in an attempt to preserve the species from total extinction.

The muskox is a favourite exhibit in most natural history museums, probably because he is an animal that most people know only by name. His peculiar appearance excites considerable interest, and the remoteness of his Arctic homeland surrounds him with an aura of mystery and romance.

Mountain Sheep

Cold mountain peaks, rocky slopes rising almost vertically from alpine valleys, treeless barrens at dizzy heights where few creatures could survive the blasts and driving blizzards of winter — this is the home of the mountain sheep. Even the sheltered valleys into which they descend for the colder months of the year are far from pleasant.

The vegetation on the mountain slopes is scant, and the sheep must travel widely to find the grasses, sedges, and dwarfed shrubs that furnish their only subsistence. They are sociable animals and travel in small bands consisting of the ewes (as the females are called) and their lambs and smaller groups of rams.

Any time from March to June (depending on the latitude) the lambs are born in some sheltered ravine or under the overhanging protection of a cliff edge. Although very tiny at birth, they grow rapidly and weigh half as much as their mothers when winter sets in. The gestation period is about six months.

Although generally peaceful, the rams often engage in fighting bouts during the rutting season in the autumn. Facing each other at some distance, the two combatants suddenly rush toward each other, often running on their hind legs, and meet head-on with earth-shaking impact that can sometimes be heard a mile away. Sometimes one or the other or both are injured, but usually they emerge with only a few slight scratches.

There are two species of mountain sheep in North America: the bighorn, which is heavy-bodied with thick, tightly curled horns in the ram, and the slender-horned, which is more graceful and has slender, pale-coloured horns. The bighorn is medium dark brown, while the slender-horned animals range from pure white to slate grey. The white or "Dall" sheep occur in northern British Columbia, the Yukon, and the Northwest Territories, and the grey or "Stone" sheep occur in northern British Columbia. The bighorn is found in southern Alberta and British Columbia, south into the United States.

Mountain Sheep

Mountain Goat

High among the mountain peaks where one would wonder how any creature could possibly survive, the mountain goat lives contentedly and actually thrives. It is a bleak world, rarely warm even in midsummer and bitterly cold from autumn to spring. It is a dangerous world, too, with avalanches and rock slides rushing unexpectedly down the icy slopes, apparently without cause or warning.

Here and there at the foot of slopes are tiny grassy areas where a few plants manage to gain a foothold and grow, and it is in these alpine meadows, if they can be so designated, that the mountain goat does its foraging. But meals must be rather skimpy at times, especially when blowing snow has covered the sparse vegetation.

Despite the mountain goat's close resemblance to the familiar barnyard animal, our mountain goat is not a goat at all. His closest relatives are, in fact, the antelopes of the Old World, but his rather humped shoulders, straight horns, and shaggy coat certainly give him a goat-like appearance.

Some time in April, May, or June, in a sheltered spot, generally under an overhanging rock ledge, the tiny kid is born. The mother leaves it in this retreat when she goes forth to feed, but she is never far away and remains always alert to the chief enemies in this mountain stronghold — the lynx and cougar. However, probably few are actually killed by these animals.

The rutting season comes in November, and while there may be some fighting among the billies, it is rarely as serious as that among the mountain sheep.

Mountain Goat

Black Bear

Black Bear

Black bears occur widely throughout the forested regions of Canada, and although not uncommon in many areas, they are rarely seen. Perhaps a faint track in the soft mud of a woodland road is the only hint of their presence, but as these animals are careful not to get their feet wet, even the tracks are not likely to be detected often. Perhaps bears are most often seen in late summer when they congregate on blueberry barrens to feast on the ripening fruits.

These wilderness dwellers have a wide range of wild foods from which to choose, including various grasses, fruits, nuts, and roots, as well as mice, birds, fish, insects, and carrion. It is therefore not surprising that by autumn they are very fat and have a sleek coat of fur. When the temperature drops well below freezing, they betake themselves to a rocky den or the cavity under a windfall to sleep away the winter months. It is not a state of true hibernation, however, and in some cases the bear may awaken for a while even in midwinter.

It is while the female is having her winter nap that the twin cubs are born. They are about the size of grey squirrels at birth, which is surprisingly small for such a large animal. If the mother were in truly deep hibernation, she would be unable to nurse her babies or keep them warm and they would soon perish. The gestation period is about 210 days, and she breeds only every second year.

There is a common belief that black bears are dangerous and that it is unsafe to travel unarmed in bear country. This is definitely not true, for the bear is dangerous only when a female is separated from her cubs or when the animal is wounded or in a trap.

Grizzly Bear

Grizzly Bear

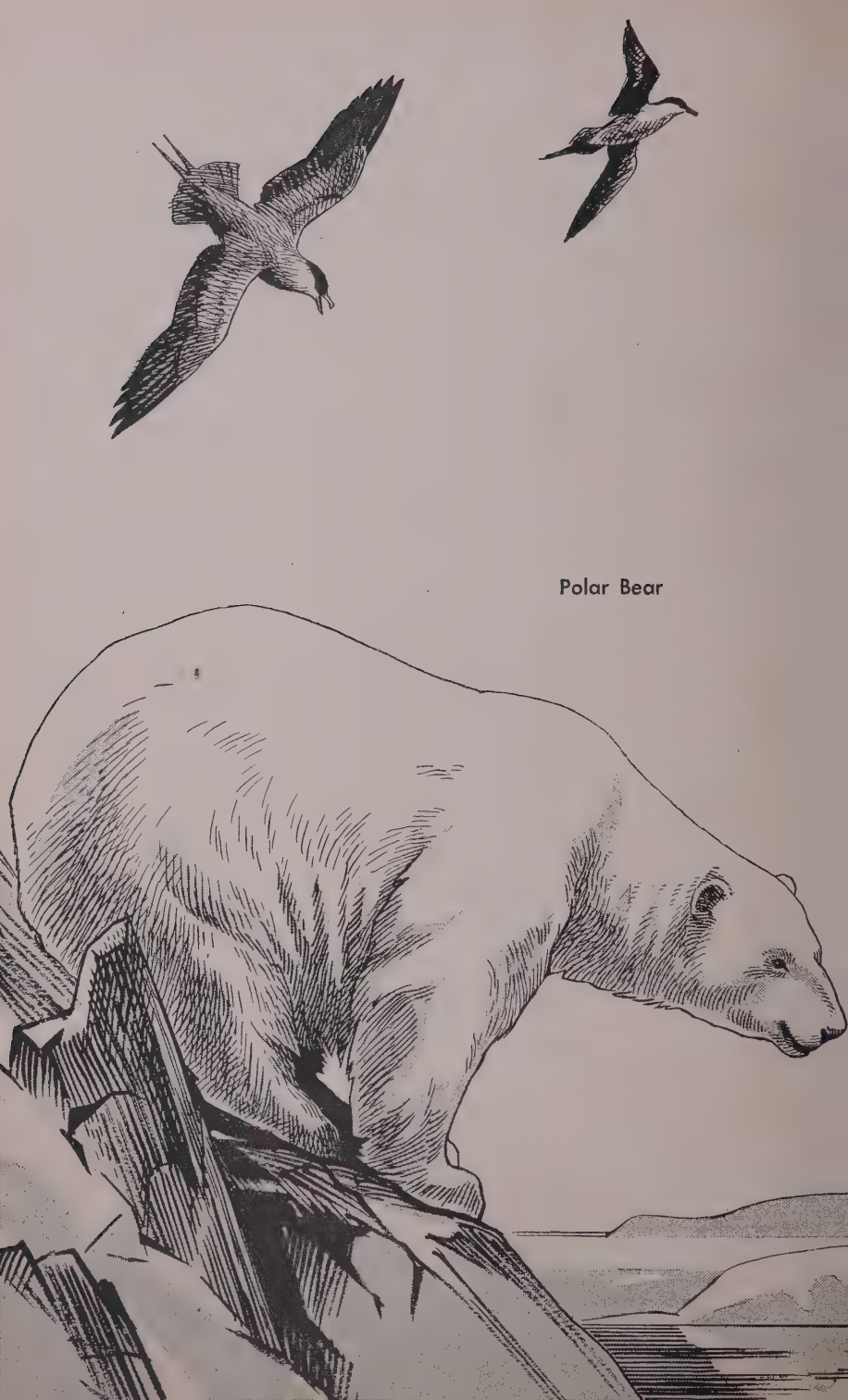
The grizzly bear is the largest land carnivore on the earth. The largest specimen on record weighed over half a ton and was over nine feet in total length.

Unlike the black bears, which are quite harmless, grizzlies cannot be trusted, and woodsmen travelling through grizzly country consider it necessary to carry firearms for protection. The general concensus of those who are familiar with the grizzly is that he will attack without provocation. On the other hand, there can be no doubt that many stories of attacks by these bears are exaggerations, and in those cases where humans have been wounded or killed it seems likely that the animal was provoked by his victim. Zoologists who have studied the grizzly recommend that if one of these animals is encountered it is well to leave him strictly alone.

Grizzlies are not choosy about their food, and like the black bear they enjoy almost anything edible, whether animal or vegetable. Because of their size, of course, they can kill animals larger than black bears would dare attack.

Mating occurs in midsummer, and the one to four (usually two) young are born in January or February. In late autumn or early winter the female digs or enlarges a winter den in which she hibernates for three or four months and where the tiny cubs, no larger than grey squirrels, are born. The female breeds every second year.

The grizzly varies in colour from pale yellowish-brown to dark brown. It has a dished-in face, quite unlike that of the black bear, and its claws are unusually long.


Polar Bear

Polar Bear

In contrast to his forest-loving relatives, the polar bear is a native of the high Arctic. The cool recesses of the southern woodlands with their bounty of wild fruits and trout-filled streams are unknown to this hardy northerner. To him, life is a bitter struggle against the cruel forces of nature, the vicious cold, the scarcity of food, and the dangers of moving ice-floes and strong currents. Yet he has survived for thousands of years in this frozen wilderness and will probably continue to live there for many centuries to come.

Like many other Arctic animals, the polar bear is white, but the fur is often tinged with lemon yellow, especially in spring and summer. Only the eyes and snout are black; these are often the only parts that can be seen as he stands against a background of ice and snow. Otherwise, the polar bear resembles his southern relatives, though he does have a somewhat longer neck and his feet are specially provided with rough pads that enable him to grip the slippery surfaces of the ice.

This species is one of the giants of his tribe. A full-grown male sometimes attains a total length of 9½ feet and weighs up to 1,600 pounds. Females are somewhat smaller. Only the Kodiak Brown Bear, a member of the grizzly group, exceeds him in size.

The polar bear lives on many species of arctic animals — lemmings, stranded whales, nesting waterfowl, and arctic charr — but seals are his chief food. His seemingly aimless wanderings are actually determined by the distribution of these marine mammals.

Hunting seals is a difficult and hazardous business, for they are exceedingly wary and live amid dangerously shifting ice-floes where an unlucky bear might be crushed to death. Usually the white bear stalks the seals while they are dozing on the edges of ice pans. His tactics are very similar to those of a sportsman hunting ducks. Taking advantage of snowdrifts and jagged pieces of ice to conceal himself, he cautiously approaches the intended victim until he is within a few feet of his quarry. Then, in one sudden leap, he descends on the hapless seal and kills it with one blow of his powerful paw. Or again, he may approach the dozing seals by swimming along the edge of the ice pans. When he is directly below his quarry, he makes a slight noise; the seal leaps into the water, and there the bear is waiting for him.

While the bears of southern climes are peacefully passing the winter in their winter dens, most of the polar bears are roaming the ice-fields. Only the females about to give birth have a winter rest

period. In late autumn she selects a snowdrift amid jagged ice heaps where she fashions a den large enough to accommodate her huge body. There, some time in December the two almost naked cubs are born, and there they remain until March or April before venturing into the outside world. By this time they are as large as small dogs and are strong enough to accompany their mother on her hunting trips.

Before the cubs can strike out on their own, they must receive a great deal of careful instruction from their mother. She teaches them the secret of how to stalk seals, where to search for stranded whales and other marine animals, and how to avoid their most dangerous enemy — the walrus. She takes them swimming with her, and when they tire she lets them ride on her back or gives them a tow by letting them grasp her tail with their teeth. Like all young animals they are filled with a burning curiosity about the world around them, and it is only under their mother's careful guidance they learn that being too inquisitive sometimes leads to trouble. They are very playful; in their idle moments they have games of hide-and-seek or wrestling bouts. When they frolic too noisily or get into mischief, she boxes their ears and makes them behave.

The polar bear has few natural enemies in his frozen homeland. Ordinarily he fears nothing, with the possible exception of the male walrus whose huge tusks can tear ugly wounds in the hide of any enemy. While on ice or on land, however, the bear is the king of his domain, and he flees from nothing. Nevertheless, in the water the walrus has the advantage, and a wise bear keeps his distance.

Polar bears are not so dangerous as most large carnivores, but because of their inquisitive nature they may injure or even kill a man. In the Far North, humans are so few that probably most polar bears never see one throughout their entire lives. When they do catch sight of one of these peculiar two-legged creatures, however, they become extremely curious and are likely to attack it in the hope of finding out just what it is. For this reason it is not safe to travel far in the land of the white bear without carrying a gun or some other means of defence.

Polar bears are favourite zoo animals and seem to thrive well in captivity. Even in warm climates they do well and do not seem to miss their native land of ice and snow. Usually a large pool of water is provided where they may frolic and cool themselves off during hot weather. They soon get to know their keeper and are usually on the friendliest of terms with him.

Raccoon

Stream borders and damp meadows are the delight of the raccoon because they provide him with the crayfish, insects, and frogs that make up the bulk of his food. He is nocturnal, setting forth on his forays after sunset and returning to his den before dawn. Much of his food is washed before it is eaten, but it is quite certain that not all food is so treated because much of it is obtained far from watered areas. Furthermore, it is suspected that in captivity the raccoon washes all his food because it is tainted by human odour.

The raccoon ranks high in the scale of "animal intelligence." He is particularly clever with his hand-like paws and has been known to open intricate objects, locks for example. The raccoon is curious about everything in his surroundings and seems to derive particular delight in exploring unfamiliar objects. Sometimes his inquisitiveness gets him into serious trouble.

In May and June the two to seven young are born in a home chosen by the female — a hollow tree, the cavity under tree roots, or a crevice in a rocky cliff. Here they remain for about two months after birth, when the mother leads them from the den out into the world.

The raccoon can be identified by its robust body, black facial mask, and the four to six black rings on the tail. Adults weigh about 15 pounds.

Ermine

Despite his small size, the ermine is one of our most ferocious wild mammals, and although he feeds largely on mice, he is not averse to killing creatures many times his own size, such as grouse and rabbits. Little escapes his keen eyes and sensitive nose, and woe betide the small mammal or bird that crosses his path. Like a streak of lightning he leaps on his victim, pinning it to the ground and at the same time seizing it by the throat. Often the ermine merely sucks the blood and samples the brain, which he evidently considers a delicacy.

The ermine changes his coat to suit the seasons, a snow-white attire for winter wear, a sombre brown for summer. The black tuft of hair on the tip of the tail, however, is not lost, even in winter. Seen against the snow, the ermine in his white coat is almost invisible, except for his black beady eyes and the black tip on his tail.

Although the ermine is often found in the deep woods and on the open plains, he prefers farmlands with their shrubby borders, stone fences, and outbuildings. He is often disliked by the farmer because of his depredations on poultry, but the over-all effect of his eating habits are favourable because he lives largely on destructive mice.

The short-tailed weasel does not make a home of its own but takes over the abandoned burrow of a squirrel or chipmunk, often one of its victims. Feathers, fur, and soft grasses line the nest cavity in the burrow in which the six to twelve young are born, usually in April or May. Both parents assist in the rearing of the young, and they perhaps remain together until the following year.

Ermine
Fisher
Marten

Marten and Fisher

The pine marten with its rather long fur, bushy tail, and large ears is a forest-dwelling member of the weasel family. About the size of the domestic cat, it varies in colour from medium brown to pale yellow.

Squirrels, mice, chipmunks, and birds of various species make up its food, and much of its time is spent in the trees pursuing its prey. The nest is usually located in a hollow tree, often an abandoned nest of the large pileated woodpecker. The one to five (usually two or three) young are born in April or May after a gestation period of from 31 to 33 weeks.

The fisher is a close relative of the marten and resembles it in many ways. It is, however, somewhat larger, and the fur is dark brown or greyish-brown grizzled with light grey. It is about the size of a small red fox.

Despite its name, the fisher rarely eats fish and has no particular preference for watered areas. Its food consists of a wide range of animals that it can readily capture, such as hares, squirrels, chipmunks, and mice. It frequently kills porcupines and is one of the few animals that can do so with impunity. The one to five (usually three) young are born after a gestation period of 50 weeks.

Both the marten and fisher originally occurred throughout the forested regions of Canada, but trappers have exterminated them in many areas.

Mink

Clear woodland streams where succulent trout lurk in the dark pools, wilderness lakes with muskrats inhabiting the reedy borders — these are the favourite haunts of the mink. He can live close to civilization and thrive, but only in the unspoiled wilderness, where his ancestors have lived for thousands of years, is he truly at home.

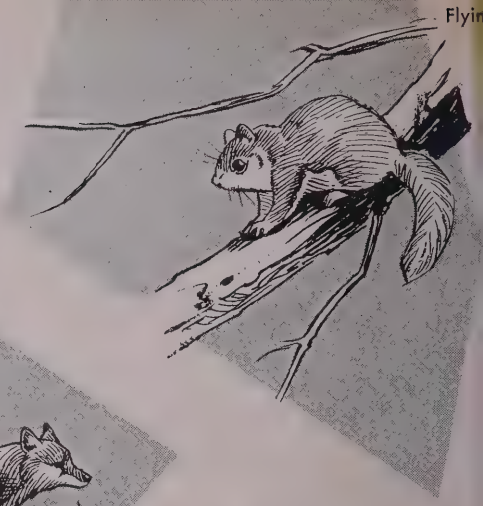
The mink is a large, semi-aquatic weasel with short legs and a rather bushy tail. In colour, he varies from medium brown to almost black and usually has a white spot on the chest. The males are a third larger than the females and weigh about two pounds.

As might be expected, the mink obtains most of his food from the lakes and streams in which he lives. Fish of various species makes up a large percentage of his diet, but muskrats, waterfowl, frogs, and insects are also eaten. Occasionally he forsakes the stream borders for the neighbouring woodlands to search for mice and other small animals.

The five to eight young are born in a cozy nursery secreted in a cavity under the roots of a tree or in a vacated muskrat lodge. The gestation period is about 42 days. The male assists the female in rearing the young.

The fur of the mink commands a high price on the fur market, and large numbers are trapped each year.

Red Squirrel

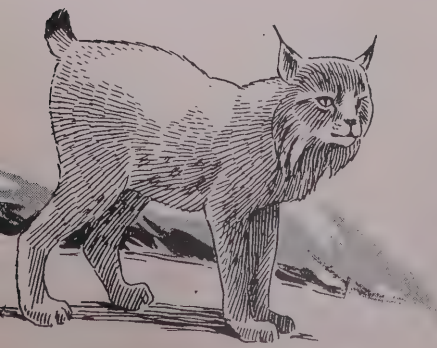


Flyi

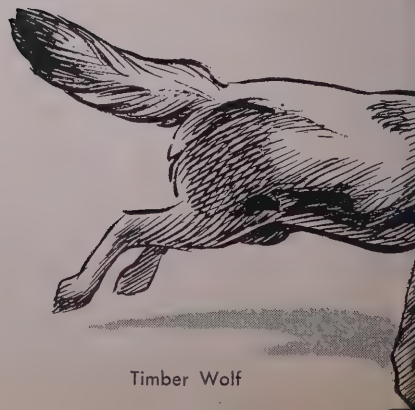
Red Fox

Bobcat

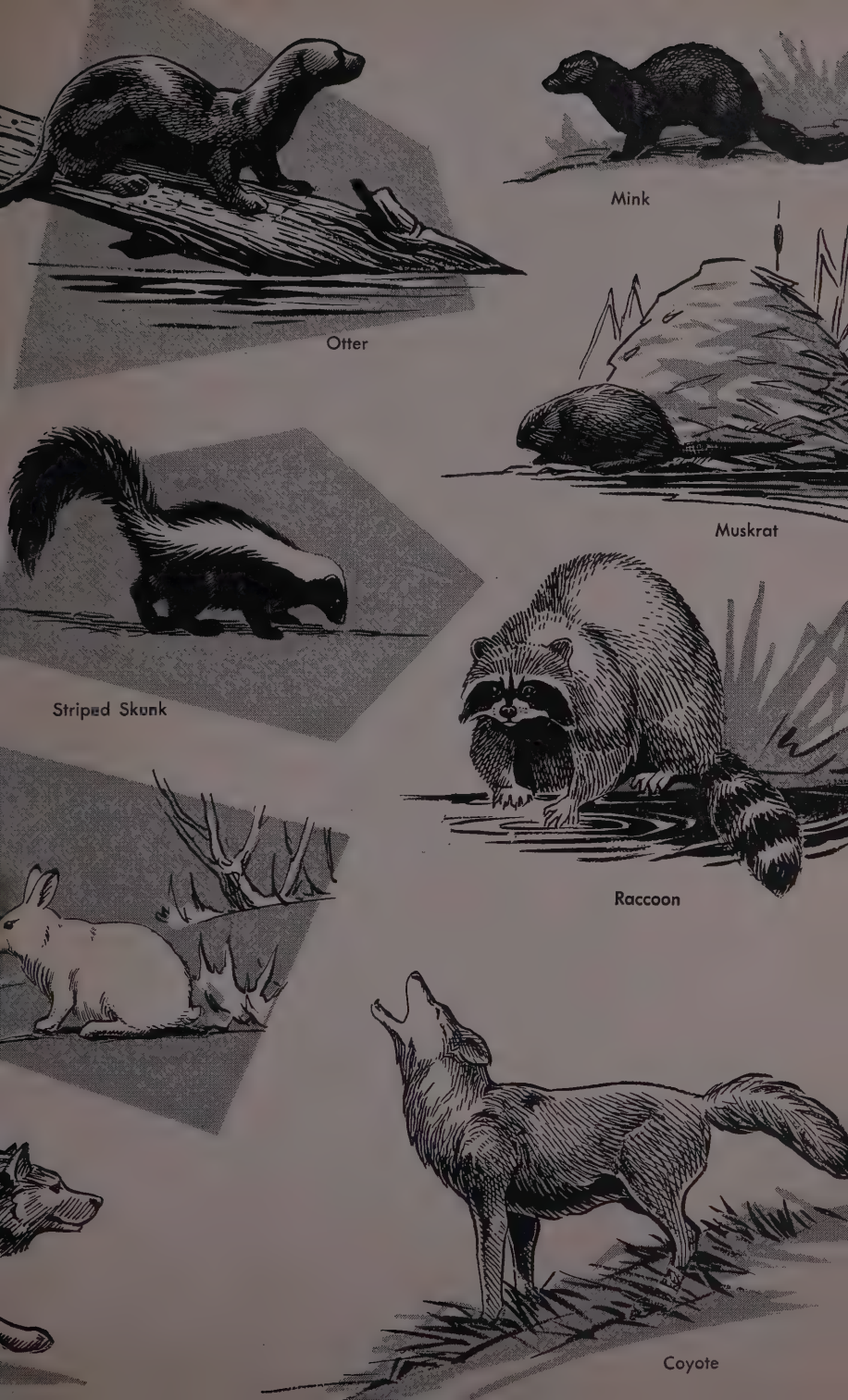
Woodchuck



Lynx



Timber Wolf


Mink
Otter
Muskrat
Striped Skunk
Raccoon
Coyote

Wolverine

The wolverine has the reputation of being an ill-tempered villainous glutton with no respect for the rights of others, not even those of his own kind. According to trappers, he will follow a trap-line and spring each trap as he comes to it, at the same time eating the bait. It is also said that he will break into food caches and cabins, and destroy everything in sight, whether edible or not. In wolverine country, no living creature, not even a moose or caribou, is said to be safe. Should a large animal get bogged down in deep snow, its fate is sealed if a wolverine should happen along.

In all probability these stories are considerably exaggerated. Although they make good telling over a camp-fire and add spice to the trapper's tale, the more lurid ones have little scientific backing. Any wild animal will attempt to rob traps or break into food caches when it is hungry; but as those who have had experience with black bears can testify, it is not a form of perversity restricted to the wolverines. And there is absolutely no evidence to support the view that the wolverine is particularly gluttonous. All carnivores eat as much food as possible when it is available, because they may not have another meal for days.

Very little is known about the life-history of the wolverine other than that the size of the litter varies from one to five (usually two or three) and the gestation period is believed to be about two months.

The wolverine is one of the larger members of the weasel family, and like all its relatives it has a musky odour produced by two glands at the base of the tail. The general colour is yellowish-brown to black with a pale forehead and a broad band of light brown extending on each side of the body, from the top of the head to the tail. Adult wolverines weigh from 25 to 40 pounds.

Wolverine

Otter

The otter is a large aquatic weasel, more partial to the larger streams and lakes than its smaller cousin, the mink. Spacious pools, with plenty of room to fish or frolic, are his special delight, and he does little else but consort with his companions. In this respect he contrasts sharply with his more serious relatives such as the ermine, badger, and wolverine. The playfulness of the otter is well known; his favourite pastime is to toboggan on muddy slopes or snow-covered hillsides. Again and again, a happy band climb the slope just for the sheer joy of sliding down. They also engage in numerous water games, such as tag and hide-and-seek.

Spring is probably the only serious time in the otter's life; because he is then saddled with family responsibilities. The one to four (usually two or three) pups are born in a bank burrow, often with entrances above or below the waterline, or in a vacant beaver lodge. The gestation period apparently is variable, ranging from 290 days to 380 days. When about 3 months old, the young join the parents in fishing and frolicking, and life becomes one endless round of tobogganing on the slopes and playing hide-and-seek in the water.

Fish, supplemented by frogs, salamanders, muskrats, rabbits, ducks, insects, and crayfish, makes up a large percentage of the otter's food. His depredations on game species are rarely serious, despite stories to the contrary.

The pelt brings a good price on the fur market, and otters are eagerly sought by trappers. Nevertheless, the otter seems to be holding its own over most of its range.

Striped Skunk

Unlike most mammals, which are dressed in sombre browns and greys that blend with the woods and fields in which they live, the skunk is strikingly attired in a black-and-white coat that makes him easily conspicuous to friend and foe alike. There is good reason for this — the skunk has no reason to conceal himself from other animals since he possesses a form of defence that protects him from possible enemies. Situated at the base of his tail, two small glands produce an evil-smelling fluid which can be sprayed from as far as twelve feet. Apart from its unpleasant odour, this fluid produces a stinging sensation if it gets in the eyes.

Contrary to popular opinion, the skunk does not strike without plenty of warning. Before bombarding an enemy he faces his supposed foe and raises his tail over his back. For several minutes he stamps the ground forcibly with his hind feet, in a sort of stiff-legged dance. If the foe does not retreat, he turns his body around with his tail directed toward the enemy, and the fluid is forcibly sprayed.

Skunks feed chiefly on insects, though some small mammals and birds are also taken when the opportunity arises. Sometimes they raid poultry houses; at others they create havoc by digging up grubs on lawns and golfing greens.

Skunk babies are born in a burrow that the female digs or in an old woodchuck den altered for her own use. Most young skunks are born in May, and they remain in the den until midsummer. There are four to seven young ones to a litter, usually five. Few sights in the animal world are quite as charming as that of a mother skunk starting out on her evening's foray with her string of babies behind her.

Red Fox

The red fox is a member of the wild dog family, to which the wolf, coyote, jackal, and domestic dog also belong. Species of this family are widespread throughout the world and native to every country except Australia and New Zealand. The species native to North America have close relatives in Europe and Asia.

Foxes are the smallest members of this family, and the red fox weighs only about 10 pounds. They have large ears, pointed noses, and long bushy tails. Certain species are forest dwellers; others live on arid plains and on the tractless arctic tundra.

Because of its wide distribution in North America, the red fox is probably the best known of the wild dogs. It does not shun civilization as do many wild animals, but frequents farm lands and delights in the brushy fringes bordering meadows and pastures where mice abound and life is easy. Although hunted by the farmer, the sportsman, and the trapper, the fox still manages to hold its own. As its name implies, this fox is reddish yellow with black legs and ears and a white-tipped tail. Besides the familiar yellow type, there are other colour phases that range all the way from greyish yellow to jet black. The most common of these is the "cross" or "patch" fox, which is yellow with a dark cross or patch across the shoulders. The "silver" fox is jet black, except for a white tip on the tail and a few white hairs sprinkled along the back which give it a somewhat frosty appearance.

Red, black, and silver foxes are not distinct species but are colour variations or phases in the same species. Two or more colour phases may occur in the same litter. These variations may be likened to the occurrence of blue-eyed or brown-eyed individuals in a human family.

The diet of the red fox consists of a great variety of foods, both animal and vegetable. In summer, meadow mice make up the chief bill-of-fare, but in winter, when mice are difficult to obtain, the fox may turn to rabbits. Insects are often consumed in large quantities, and in years when grasshoppers are plentiful they may make up as much as 90 per cent of its food. Chipmunks, woodchucks, and squirrels are occasionally eaten; shrews and moles may be captured but because of their musky odour are rarely consumed. Small quantities of grass are eaten at times, and many wild fruits, such as blackberries, grapes, cherries, blueberries, and apples, are highly relished. The fox seems to select its food carefully in order to obtain a balanced and healthful diet. Sometimes it even eats clay and gravel, perhaps to obtain some essential minerals.

Although the fox feeds chiefly on mice and other destructive animals, it occasionally raids poultry-yards and will not pass up a

pheasant or muskrat when the opportunity presents itself. Because it destroys other animals valuable to man, farmers and sportsmen consider the fox a predator or robber, and trap or shoot it on sight. Nevertheless, the fox renders valuable service as a destroyer of harmful rodents, and in most cases it should not be molested.

Foxes mate in February or March, and the four to nine kits are born in April or May. The parents are faithful to each other and remain together until the young are able to fend for themselves. Both share in the feeding and training of their young and are among the most devoted parents in the animal world. From the time the first shades of dusk creep over the woodland until dawn breaks in the east, the parents wander far and near busily searching for mice and other small animals. Like all growing youngsters, fox kits are always hungry, and it takes all the parents' time and energy to provide enough food to satisfy their ravenous appetites.

Young foxes have all the playful and amusing antics of puppies. When only 5 weeks old, they may be seen romping about the entrance to their home, squabbling over food tit-bits, and engaging in wrestling bouts and other games which help to exercise their muscles. Old bones are favourite playthings, and each kit seems to have its own personal toy, for when the parents find it necessary to move the family to another den, these bones and other objects, for no other apparent reason, are transported to their new home. Part of the training that the young receive from their parents includes lessons in hunting and in avoiding their many enemies.

Playfulness is a characteristic of almost all young animals, and students of animal behaviour believe that such activities are just as important for them in their preparation for adult life as they are for children. Adult animals can also be playful at times: foxes have been seen playing with caribou, and apparently both were enjoying the game immensely.

The brilliant lustre of the fox's fur makes it one of the finest of all pelts for fashion purposes, and very little preparatory treatment is required to bring out its natural beauty. So much in demand were silver foxes at the beginning of the present century that an important industry grew up in the raising of these animals in captivity.

Timber Wolf

The wolf is the closest relative of the domestic dog. In fact, most domestic breeds of dog are descendants of the Asiatic wolf. Wolves are grouped with foxes, coyotes, and jackals in the family Canidae. More distant relatives include the cats, bears, raccoons, weasels, and other flesh-eaters. All those animals that live chiefly on flesh have large well-developed teeth, suitable for tearing and shearing flesh.

The North American timber wolf and its close relatives in northern Asia are the largest and most powerful of all the wild dogs. They range from 4 to 7 feet in total length and weigh from 30 to 100 pounds. In appearance they resemble large police or German shepherd dogs and vary in coloration from pure white to jet black. The usual colour is a grizzled grey, darker above and paler below. Northern wolves, however, tend to be paler than their southern cousins.

The huskies used as sled dogs in the Far North are usually part wolf. The wolf, however, is more slender, with longer legs and a narrower chest. The coyote or brush wolf resembles a small timber wolf but has a more pointed nose and much smaller ears and feet.

The timber wolf, widely distributed over North America, ranges from the cottonwoods of the deep south to the arctic tundra. In Canada, it formerly occupied all the timbered regions but is now extinct in the Maritime Provinces and Newfoundland. Unlike its smaller relative, the fox, it shuns civilization and prefers the unspoiled wilderness.

Wolves are sociable animals and live in packs made up of the parents and their young, as well as close relatives. From time to time new members are added to the group, but a stranger is not accepted until each member of the pack shows his approval. Often the stranger is driven away.

Wolves on the hunt depend on the co-operation of the pack. When running down elk, deer, or other large animals, they work in relays. One member of the pack starts the animal and pursues it until he tires. Then another takes up the chase, and so on until the intended victim either is overcome or escapes. Usually the wolves pick on an old or sickly animal that can easily be overtaken and killed.

Some large mammals, such as the bison and muskox, do not take flight when harassed by wolves but stand their ground in a closely packed group with the larger and stronger males on the outside. The wolves' only hope under such circumstances is to try to separate one animal from the herd. Stalking these powerful creatures is a most hazardous undertaking. If the wolves should come too near the herd, an enraged bull may charge and trample or gore them to death.

In winter they have little difficulty in running down deer or moose in deep snow. Any of the kill not eaten is stored for future use.

Wolves are considered cruel and bloodthirsty, yet they are among the most devoted of wild parents and always remain faithful to their comrades and mates. In times of great need they help one another, and a mother wolf will adopt orphaned pups and bring them up as her own. When the mother tires of her noisy youngsters, another female may act as a foster-mother while the mother goes hunting with the pack. Even the old males are affectionate with the pups and will put up with their mischievous deeds with enduring patience.

As wolves sometimes kill livestock and game animals, they are unpopular with both farmers and sportsmen. Yet they have a place in Nature. They keep down the numbers of many wild animals that would otherwise become so numerous that they would soon deplete the food supply. This has happened in parts of North America where deer became so abundant that there was not enough food to go around, and many died of starvation. Wolves also destroy sick animals and in this way prevent the spread of diseases that might otherwise wipe out an entire herd.

When the male is 2 or 3 years old, he looks for a mate. Sometimes she is a member of his own pack, but generally she is a complete stranger. Once paired, they remain faithful for life. For a den they often select a natural cavity, but if one is not available they co-operate in the digging of a burrow.

In April or May the four to fourteen fuzzy little brown pups, with their short tails and blunt noses, come into the world. For some weeks they remain with their mother in the den while their father wanders far and near in search of food. In about a week their eyes are open, and before long they may be seen romping and playing at the entrance to the den. In midsummer the family moves on to better hunting grounds, and the young are taught all the secrets of life in the wilderness.

Wolves eat a great variety of foods, but mice and ground squirrels are the chief items. Big game and livestock are occasionally killed, but the wolf prefers, whenever possible, to stick to the smaller, less dangerous animals. It eats far less vegetable food than its smaller cousins, the foxes and coyotes, but does consume small quantities of grass.

To his enemies, the wolf is a bloodthirsty and merciless killer, but to his mate and his comrades he is a devoted and faithful friend. Above all, he is an animal that depends on his wits for survival and for that reason is one of our most clever and versatile wild animals. Little wonder that when domesticated many thousands of years ago as the familiar dog, he became man's closest friend.

Cougar

Cougar

The cougar is the only long-tailed cat native to Canada. When full-grown it is considerably larger than either the lynx or the bobcat and is of a generally uniform coloration, either reddish-brown or medium grey with various intermediate shades. The tip of the tail, the upper lip, and the backs of the ears are black. The underparts are a dull white.

The males measure from 6 to 7½ feet from the tip of the snout to the tip of the tail and stand almost 3 feet at the shoulder. The tail varies from 2 to 3 feet in length. Males weigh 150 to 250 pounds; females about a third less.

The cougar prefers wild, rugged country where he is unmolested by civilization. Like his close relative, the domestic cat, he hunts by stalking rather than by long chase and frequently waits in the crutch of a large tree or on an overhanging ledge for his prey to pass within striking distance. Then leaping suddenly, he pins his unsuspecting victim to the ground, and at the same time shears the neck open and severs the jugular vein. The prey is eaten on the spot or dragged off to a secluded place where the big cat can feed in peace. Whatever is left after he has had his fill is buried for future use.

Deer appear to be his favourite prey, but young cattle and horses are also taken when circumstances permit. Although quite capable of killing a man without difficulty, there are few authentic cases of his having done so.

The two to four spotted kittens are usually born in the spring after a gestation period of about 90 days. The den is either a cave or a dense thicket, and the female assumes the full burden of rearing the young.

The cougar has acquired various names in different parts of its range throughout North and South America, the most common of which are the puma, mountain lion, panther, and catamount.

Lynx and Bobcat

Two species of bobtailed wildcats occur in Canada: the lynx and the bobcat. The lynx is the denizen of the northern evergreen forests, while his smaller cousin, the bobcat, prefers the mixed forests of more southern latitudes.

The two species are often confused, though they differ in a number of important respects. The lynx is ashen grey with long pencils of black hair projecting from the tips of the ears, a well-developed neck ruff, and unusually large feet for his size. The bobcat, on the other hand, is a pale rufous-brown with darker brown streaks and spots on the sides of the body and particularly on the legs. The pelt or the carcass can be readily identified in each case by examining the tail. In the lynx, the tail is uniformly grey above and white below with a black tip. The tail of the bobcat has several rings or bars on its upper surface, and only the upperside of the tip of the tail is black; the underside is white.

Both species feed on smaller animals, and the lynx is particularly partial to the snowshoe hare which seems to be its staple food. When the hares decline drastically in numbers, as they do every ten years, the lynx is faced with a serious food shortage.

A rocky cave or the cavity under the roots of a windfall provides these cats with a nursery where the two to four kittens are born after a gestation period of about two months. Like most young cats, their coats are quite heavily streaked.

Contrary to popular opinion, these cats are not dangerous and are so secretive that they are rarely seen, even when they are not uncommon. The numbers of game birds and mammals that they kill for food is actually very small despite reports that they are destructive "varmints."

Harbour Seal

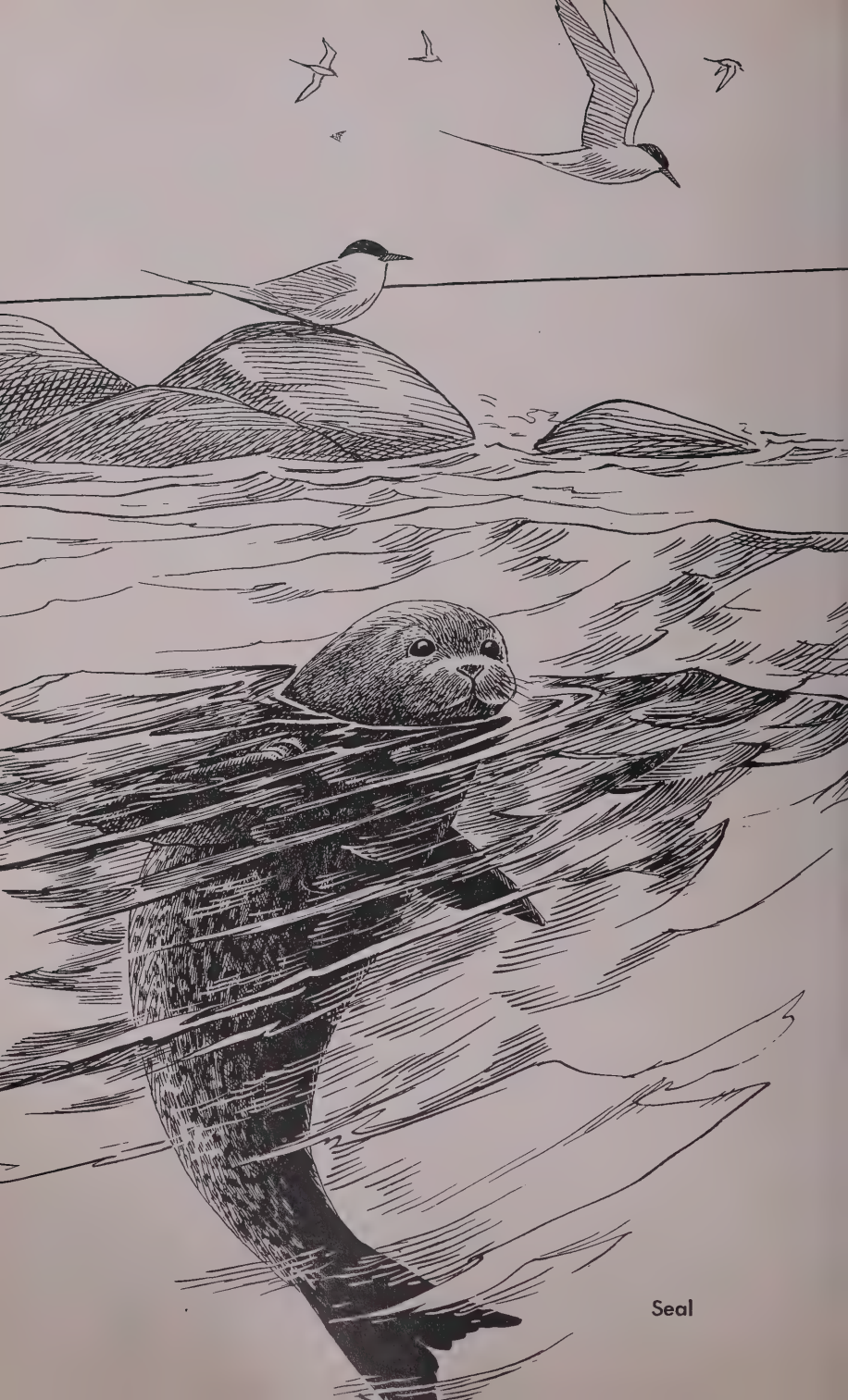
In the quiet bays and inlets of our coasts, where peace reigns throughout the long summer days, it is not unusual to see what appear to be isolated rocks suddenly submerge and disappear. These are harbour seals that come into the bays each day to lie on the rocks and bask in the sun. When the tide is high and the fish are active, they move off into deeper waters to feed.

Apart from the grey seal, the harbour seal is the only member of the tribe that ordinarily spends the summer in southern Canada. He is a small species, rarely exceeding 6 feet in total length, with a pale grey coat, indistinctly mottled and blotched with darker grey. The dark markings are responsible for another name often applied to him — "leopard seal". To most fishermen he is known as the "bay seal", but in Newfoundland he bears the unusual name "ranger".

The baby seal is born in May or June, either on a rocky beach or a flat boulder in shallow water. It may have a short woolly coat of white hair, but this is generally shed before it is born. For the first few weeks it remains in its nursery while the mother is absent. Possibly it can swim at birth, though most young seals have to learn to swim.

Various fish make up the food of this seal, but it also eats squids and a variety of shrimp-like creatures that frequent our coasts.

The harbour seal is disliked by fishermen not only because it gets into nets, often tearing great gaping holes in them, but because it harbours a parasitic worm that also infests the cod and makes it undesirable for human consumption.



Seal

Harp Seal

The harp seal is probably the most abundant mammal of its tribe in the northern hemisphere. Each year thousands crowd the ice-floes that move down into the Gulf of St. Lawrence and along the coasts of Newfoundland and Nova Scotia. Indeed, the leading edge of the ice-pack may be blackened by the herds, and on calm days their loud barking carries for miles across the sea and ice.

The harp seal is a small seal, as seals go. The adult male rarely exceeds 6 feet in total length. This mammal gets its common name from a horseshoe-shaped band of black straddling the back of the male. The ground colour is pale yellowish-grey. The "harp" is less evident in the female and may consist of but a few large, dark blotches. Immatures are a dull grey with various dark spottings and mottlings.

It is while these seals are in their southern quarters that the females give birth to the single young. It is born on the heavier ice and remains there for several weeks. During this period its coat is pure white. Strangely enough, young harp seals must learn to swim. Although there may be thousands of baby seals on an ice pan, the female has no difficulty finding her own pup. This is all the more remarkable when we consider that the ice pan may have drifted some distance and changed position while the female was absent.

Each year, thousands of baby "white-coats" are killed for their white, fluffy coats which are used extensively in the fur trade. In order that the population should not be endangered, the Canadian Department of Fisheries has implemented various conservation measures for their preservation.

Woodchuck and Marmot

Basking in the summer sunshine on a grassy hillside, the woodchuck seems to lead a delightfully indolent life at a time when all the other creatures about him are busy building nests or rearing young. And, in fact, life is kind to the groundhog, for he enjoys the bounty of summer when the days are long and pleasant and food is abundant, and when winter comes with its low temperatures and food shortages, he is snugly tucked away in his warm underground burrow.

Because his food consists of a large variety of grasses and herbs he rarely suffers from shortage. Probably early spring, when he emerges from hibernation, is the only time he may feel the pangs of hunger.

The four to five young are born in an underground nursery in May or June. Although blind and naked at birth, they grow quickly and come to the surface when a month old to enjoy the sunshine and sample the herbage. The gestation period is about one month.

The woodchuck is a true hibernator; that is, his winter sleep is so profound that his body temperature drops to about 40 degrees F., his pulse is faint, and he breathes only three or four times a minute.

The woodchuck is really a large, plump ground squirrel, weighing from 5 to 10 pounds. His coat varies in colour from reddish brown to sooty grey, with all sorts of intermediate tones.

The marmot is a large woodchuck, either dark grey with a dark crown and neck, or reddish brown wtih a dark grey face, depending on species. Both the hoary and yellow-bellied marmots are found in our western mountains where they live among the rock slides of steep mountain slopes. Marmots weigh anywhere from 6 to 15 pounds.

Richardson Ground Squirrel

It is difficult to imagine the Canadian prairies without the ubiquitous "gopher". These animals seem to be everywhere, each sitting at the entrance to his burrow, curious of any intruder and ready to dive into his retreat at the slightest provocation. Generally, with a flick of his tail and a high, whistle-like "chirrup" he retreats to safety upon sighting a coyote loping along in his direction, a badger in search of his dinner, or a hawk soaring overhead.

The ground squirrel is a close relative of the chipmunks and red and grey squirrels, and like them is active by day and rests during the night. He feeds on all forms of low vegetation such as grasses, herbs, seeds, and various fruits, as well as large quantities of insects. In areas where he is numerous, he is a serious agricultural pest and much disliked by the farmer and rancher. Naturally, where "gophers" are abundant, there is less forage available for cattle, and the quantity of cultivated plants they consume is often tremendous.

The two to eleven young are born in a special nursery chamber at or near the end of the underground tunnel. The gestation period is of about 28 to 32 days duration, and the young are independent by the time they are six weeks old. They cannot linger in the nest too long as the female mates almost as soon as the first litter is born.

Unlike the tree squirrels, the ground squirrels are true hibernators and sleep away the colder months of the year in specially constructed underground chambers.

Besides the Richardson ground squirrel, which is the commonest "gopher" on the Canadian prairies, there are several other species, such as the thirteen-lined, Franklin, Columbian, Parry's, and mantled. All are quite similar in appearance and habits, except for the mantled, which is richly coloured in bright browns and greys, and more closely resembles a chipmunk. The other species are a uniform brownish-grey with mottlings or stripes of darker grey or brown.

Chipmunk
Richardson Ground Squirrel

Chipmunk

The friendly chipmunk is a great favourite among those who are fortunate enough to live in or near the woods. With none of the boisterous behaviour of his close relative, the red squirrel, he goes about his daily tasks with a minimum of fanfare. Encouraged, he appreciates the friendly advances of humans, but if they wish to keep their distance he is content to leave them strictly alone.

The chipmunk prefers the shrubby borders of fields and open woods where small trees and shrubs form a dense tangle. In a hillock on the forest floor or perhaps under a stone or fallen log, the burrow leading to the underground nest is hidden. It is often difficult to find, as the chipmunk never leaves excavated earth near the entrance.

The three to five young are born in the underground nursery after a gestation period of 31 days. In Canada there are probably two litters a year.

Chipmunks eat a wide variety of seeds and nuts, wild fruits and berries. Although they hibernate during the colder months of winter, they nevertheless lay aside a food supply, probably for the lean weeks after they have emerged from their winter sleep, when the vegetation is still scant.

Two groups of chipmunks occur in Canada, the eastern chipmunk which ranges from Nova Scotia west to Manitoba, and the western chipmunk which occurs in western Ontario and ranges west to British Columbia and the Yukon. The eastern chipmunk is larger than the western species and generally more brightly coloured.

Northern Flying Squirrel

The flying squirrel is most surely a creature of the night, for it never leaves its daytime retreat until the woodland is enveloped in darkness. It then returns to its sleeping place well before the first light of dawn. It is not surprising, therefore, that even in areas where it is common, it is rarely seen.

While this squirrel cannot fly in the true sense of the word, it is a marvellous glider and can sail with ease for a distance of forty yards or more. It generally springs from the top of a tall tree and glides downward, checking its speed abruptly as it approaches the trunk of the tree on which it lands. The flattened tail serves as a rudder, and it can make surprisingly sharp turns in the course of its "flight."

The flying squirrel can be readily identified by its pale fawn coloration, large eyes, and the thin membranes connecting the front and hind legs. These membranes appear as folds when the animal is at rest.

Very little is known about the family life of the northern flying squirrel, but apparently the young are born some time between April and June with perhaps a litter in the autumn. The nest may be secreted in a hollow tree or an abandoned woodpecker hole, or it may consist of a spherical mass of twigs and leaves constructed in the branches of a tree.

These squirrels feed on a wide variety of seeds, nuts, fruits, and berries, some of which is stored for winter use as this squirrel does not hibernate.

The northern flying squirrel ranges throughout the evergreen forests from Nova Scotia to British Columbia and north to the limit of trees.

Red Squirrel

The noisy red squirrel is unquestionably the most familiar of Canadian mammals. Every nook and cranny of our vast evergreen forests appear to harbour at least a pair of these red rascals. They seem to have the notion that their particular corner of the woodland is personal property, and any creature, mammal or bird, that dares to intrude is severely scolded. Whenever these squirrels vent their rage, a horde of birds and other small mammals gather to join in the general uproar.

This squirrel finds most of its food in the trees in which it lives. During the late summer and early autumn it is kept busy from dawn to dusk harvesting for winter use the seeds and cones, berries and wild fruits of trees and shrubs. Most of this provender is buried in the ground and unearthed when needed. Many of the seeds and nuts, however, are forgotten and eventually sprout to provide the forests in years to come. Mushrooms and toadstools, many of them poisonous to man, are also harvested and eaten. The squirrels place these fungi in the branches of trees to dry before storing them; they seem to realize that if stored fresh they would merely decay. Although the squirrel performs a great service to mankind by distributing the nuts and seeds of forest trees far from the parent tree, it offsets these good deeds by pilfering the nests of wild birds.

An old woodpecker hole or a burrow in the ground generally serves as a nest, and it is here that the four to seven young are born in April or May. There may be a second litter in the early autumn. The young remain in the nest for about a month.

The red squirrel ranges across Canada throughout the evergreen forests from coast to coast north to the limit of trees. It is absent, however, from Anticosti and Newfoundland.

Beaver

The beaver is the largest North American rodent, some old males having been known to attain a weight of 100 pounds. On the average, however, adult males weigh about 50 pounds. The beaver may be distinguished from all other rodents not only by its large size but also by its flat, trowel-like tail. Like most aquatic mammals it has webbed feet and, in addition, has valves in its ears and nostrils that close when it swims under water. Its dense fur provides protection against the cold water in which it lives. The long, sharp teeth, with which the beaver obtains both food and material for shelter, continue to grow during its lifetime.

Beaver usually live in colonies, although at times a lone individual may be found living by himself in a burrow located in the bank of a stream or lake. In a typical colony there may be as many as twelve individuals: the two adults, several 2-year olds, and the young of the current year. They all co-operate in the work of the colony as soon as they are old enough to do so and continue to assist their parents until they are 2 or 3 years old, when they set out to found colonies of their own.

The beaver's home is a house or lodge built of sticks and mud and is located in the shallow part of a stream or pond, or on the edge of a lake or river. In general appearance it resembles a conical heap of dead sticks about 15 feet in diameter and 4 feet high. There are one or more under-water entrances that lead into a spacious room about 5 feet in diameter and 3 feet high. This serves as both living-room and bedroom and is usually without a floor covering. In early spring however, when the young are born, they cover the floor with rushes. These they replace with fresh ones as they become soiled. When the colony outgrows the lodge, the beavers may enlarge the room and add more sticks and mud to the outside. Some lodges attain gigantic proportions; one recorded was 30 feet across and 7 feet high.

The lodge must be situated near water, deep enough to keep the entrances under water throughout the year and to provide plenty of room for storing food for winter use. This is not always a simple matter, and frequently the beaver must construct a dam on the river or at the outlet of the lake so that he can regulate the water level to suit his needs. The first step in the construction of a dam is to choose a narrow place in the stream and to block it with trees, rocks, mud, and whatever else may be at hand. Large trees are floated or dragged to the site and firmly anchored by covering them with rocks and mud. Smaller branches are then added to fill in the spaces between the larger trees. Finally, the whole heap is plastered with mud. Although it may not be completely water-tight, the dam holds back enough water to assure the beavers of a fairly constant water level in their artificial pond.

Beaver and Beaver House
Ventilating Flue
Plastering of Frozen Mud
Sleeping Floor
Diving Floor
Store of Winter Food
Ice
Entrance

Of all the beaver's amazing feats, perhaps his ability to fell full-grown trees is the most remarkable. Sitting up on his haunches with his tail as a prop, he goes slowly round the tree and cuts a narrow notch with his upper teeth. Then he sinks his long lower teeth into the trunk at a point below the notch, and the section of wood between the two cuts comes out as a large chip. He continues this operation until the tree is supported only by a slender piece of wood. Suddenly the tree comes crashing to the ground. In the meantime the beaver moves quickly away for fear of being pinned under the trunk. When all is silent in the woods, he returns to complete his work.

Once the tree is felled, there remains the problem of transporting it to the lodge or dam site. If it is small, he may be able to drag it to the water without further ado. But usually it is necessary to remove the branches and then to cut the trunk in lengths that are convenient for handling. If the tree is a considerable distance from water, the beaver may decide to dig a canal from the water to the tree and to float the sections of trunk to a lake or stream.

The beaver's food consists largely of the bark of such hardwood trees as poplar, aspen, birch, cherry, willow, maple, and alder, although aspen and related trees are favourites. In summer he may also eat certain aquatic plants, such as wild celery, duck potato, water-lily, and duck weed. Like many other wild animals in our climate, the beaver must provide for winter. This he does by storing the trunks and branches of hardwood trees at the bottom of his pond near the lodge. He weights them down by piling water-logged wood on top of them, and he also pushes some of them part way into the mud. Then, when the pond is frozen over, he can swim out under the ice and obtain his food without difficulty.

In May or June the one to six (usually three or four) young beavers are born. From the very beginning their eyes are open, and they are fully furred. At first they remain in the lodge, nestled among the grass, leaves, and twigs, which the parents have placed there to serve as a bed. But after two or three weeks they venture outside where they romp and play in the water. Unlike young seals and many other aquatic mammal babies, they seem to know how to swim from the very beginning.

The beaver is of particular interest not only because of his fascinating habits but because of his very important role in the exploration of the part of North America now known as Canada. In the early days of discovery the quest for beaver pelts, which were then much in demand in Europe, prompted trappers and explorers to push farther and farther into the wilderness, and as a result they discovered much of our country that might otherwise have remained unknown for decades. In recognition of its historic importance, the beaver has been chosen as a national emblem, and its likeness appears on many Canadian emblems, badges, and coins.

Deer Mouse

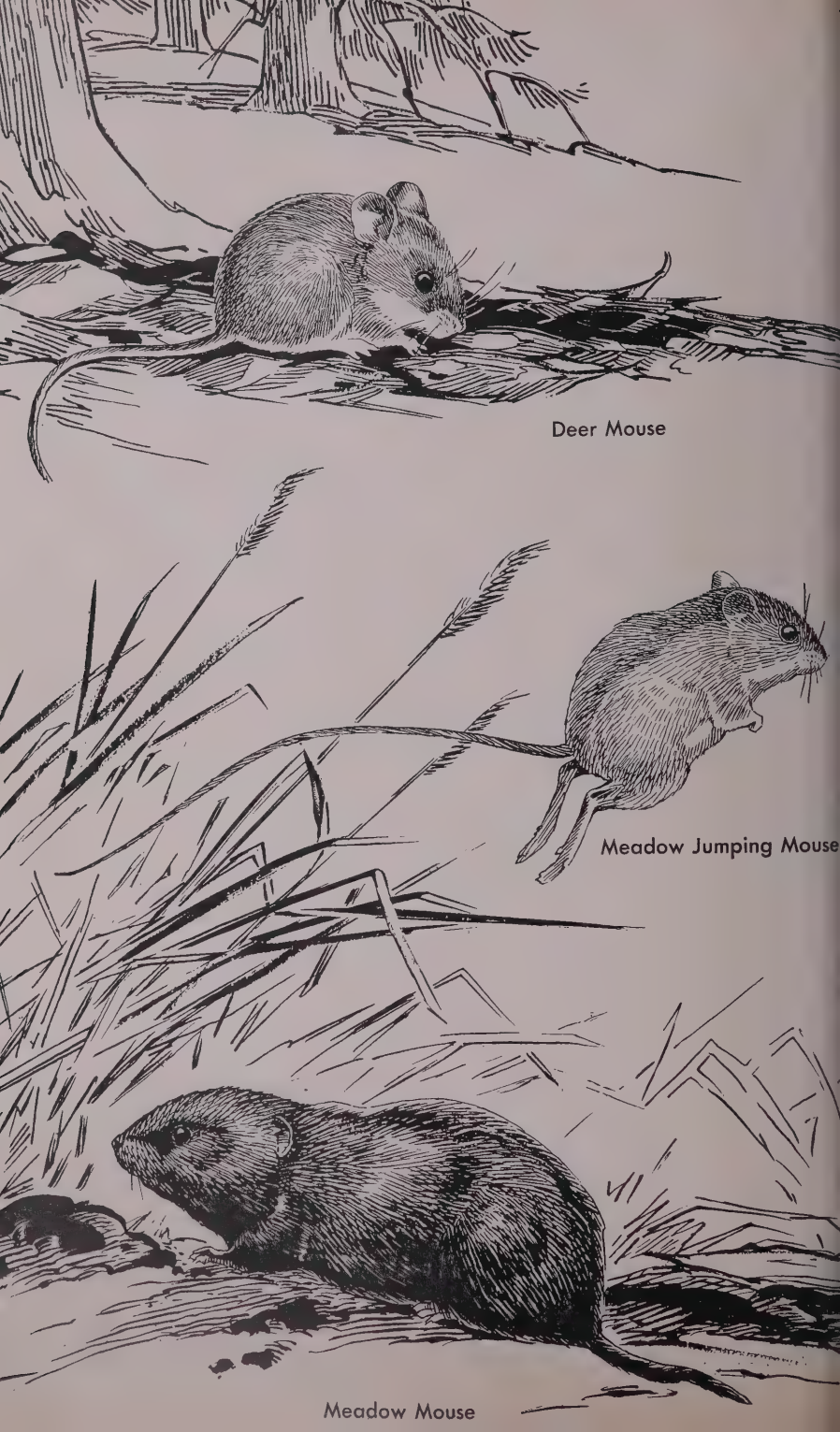
Anyone who has lived in a cabin in the woods is familiar with the dainty deer mouse. Generally he appears after dusk, when all is quiet, and the human occupants have settled down for the night. He explores every nook and cranny in search of crumbs and other tit-bits. So confiding is he in his human friends that no one has the heart to take drastic action, and he continues pilfering unmolested.

The deer mouse is one of the most widely distributed of North American mammals, ranging from Nova Scotia and the Labrador Coast to the Pacific Coast north to the Yukon. Every woodland, whether evergreen or deciduous, seems to harbour at least a few of these tiny mammals.

Deer mice, unlike some small mammals, are active throughout the year and store sizable quantities of seeds and small nuts for winter use. The writer once found a pint of maple seeds stored in an old stocking hanging in a deserted cabin.

Young deer mice are born during the warmer months of the year, usually four to a litter. The nest consists of a compact mass of dry vegetation, hair, and feathers placed at the bottom of a burrow fashioned by the mice themselves, or in a cranny under a rock or stump. Sometimes it is a deserted bird's nest in a tree, which the mice roof over.

These mice are of no direct economic importance, but they do serve as food for numerous predatory animals, most of which are fur-bearers.


Deer Mouse
Meadow Jumping Mouse
Meadow Mouse

Meadow Mouse

A common sight in fields and meadows is the patchwork of meandering trails made by meadow mice travelling from their nests to feeding areas. In years when these rodents are abundant, an entire hayfield may be riddled by their burrows and trails. They may often be seen at mowing time scurrying from under the advancing mower, and after the fields have been cleared of vegetation, hay-stacks are favourite refuges.

Meadow mice have a four-year cycle; that is, approximately every four years they reach a peak in abundance followed by a period of great scarcity. Although the cause of this rhythmic change in numbers is unknown, it has no bearing on the abundance of owls, foxes, or weasels.

The meadow mouse is a large species, as mice go, with a coat of grizzled brown fur and a short tail. Although closely related to the red-backed mouse of the woods, he can be distinguished from that species on the basis of colour alone. The red-back is usually a bright rusty-red, although a few are mostly grey. The bog lemming with its very short tail scarcely exceeding the length of the hind foot also differs from the meadow mouse. The rock mole is very similar in size and colour but has a conspicuous yellow snout. The phenacomys mouse is also quite similar but has a yellowish snout and a yellowish rump patch. Rodents are often difficult to identify, and specimens should be forwarded to a qualified zoologist for determination.

Large families are the rule among these mice, and one litter follows the other in rapid succession. Females less than a month old are in breeding condition, and the gestation period is 21 days. From six to eight young are born to a litter, and they are weaned when 14 days old. Little wonder that they can attain such tremendous numbers!

As might be expected, these mice have a large number of enemies — owls, hawks, foxes, crows, ravens, weasels, mink, coyotes, lynx, and snakes. Despite the fact that they are an agricultural pest, they form an important link in the animal food chain.

Muskrat

The muskrat is a rather large aquatic rodent related to the meadow mouse of our fields and meadows. Wherever there are vegetated ponds or slow-moving, shallow streams, muskrats are almost certain to be present. They are especially abundant in marshes where there are extensive stands of cat-tail — their favourite food.

Muskrats may live in bank burrows or in lodges or houses constructed by bringing together great quantities of dead vegetation. Fashioned in the form of a low dome, they are a common sight in marshes and along pond borders. Within the lodge is a cozy sleeping chamber and near the entrance a dining room. There may be one or two underwater entrances to the nest.

Here the one to eleven (usually five to seven) young are born any time from spring to autumn after a gestation period of 29 to 30 days. They are on their own when they are about four weeks old.

Muskrats often live in close association with the beaver, especially in old beaver dams where there is an abundance of aquatic vegetation. The beaver dislikes the muskrats but tolerates them.

The muskrat has many enemies including the mink, lynx, red fox, and Great Horned Owl. Their numbers are also kept in check by parasites and disease, drought and flooding.

Jumping Mice

The jumping mice, with their amazingly long tails and bright colours are quite unlike any other Canadian rodents. In fact, the term "mouse" seems a most inappropriate term to apply to them.

The very long tail, which exceeds the combined length of head and body, and the rich nutmeg brown of the back, the bright buff, yellow or orange of the sides, and the pure white underparts, set these mice apart as among our most attractive small mammals. Because of their habit of leaping, rather than running, they are also known as "kangaroo mice."

Two species occur in Canada, the woodland jumping mouse which has bright yellow sides and a white-tipped tail, and the meadow jumping mouse which has pale yellow sides and a uniformly coloured tail.

The meadow jumping mouse prefers damp fields and meadows. As it is rarely abundant and moves about mostly at night, it is not often seen. Farmers occasionally see them leaping before the advancing mower at haying time.

Open glades in the woods, especially near small streams, are the home of the woodland jumping mouse. Like the meadow jumping mouse, it is rarely seen because it is uncommon and nocturnal.

Both species occur from Nova Scotia west to Manitoba and north to southern Labrador. The meadow jumping mouse also ranges west to the Pacific Coast and north to the Yukon.

Snowshoe Hare

The snowshoe or varying hare is common and often abundant throughout the evergreen forests of Canada from coast to coast and north to the limit of trees. At quite regular periods, usually of about ten years' duration, these hares reach tremendous abundance, followed in two or three years by great scarcity. The cause or causes of these cyclic fluctuations have not been determined, but it is known that abundance of foxes, lynx, and other predatory animals has little or no effect on population changes.

Like the ermine and the collared lemming of the Arctic, the snowshoe hare changes its coat to suit the season. Throughout almost the whole of Canada the wood brown summer attire is gradually replaced by a completely new coat of white hair in the autumn. The situation is reversed in the spring when the white coat is shed with the growth of the summer fur.

The one to ten young (usually three or four) are born any time from spring to autumn after a gestation period of from 37 to 40 days. The female makes no attempt to fashion a nest of any sort, and the young are generally born in a sheltered thicket. Unlike young cottontail rabbits, young hares are fully-furred at birth, and their eyes are open. They nurse for about a month but begin eating tender bits of vegetation when only ten days old.

A wide range of vegetation makes up the food of this hare. In summer its diet is largely tender herbs; in winter the tiny twigs of trees and shrubs make up the bill-of-fare.

Hares are very important economically as they provide a tremendous amount of food for human consumption annually. Also many predators, such as lynx and foxes, depend in large measure on them for food, and when they decline in numbers, the predators are forced to turn to other animals.

Porcupine

Armed with a thousand sharp-pointed quills, distributed over his back and tail, the porcupine is the most feared of our native rodents. Stories are legion of how the "porky" can throw these quills at an intruder and of the dire consequences of being struck. Actually, the quills cannot be thrown, but so loosely are they attached to the skin that they will penetrate any soft object with which they come in contact. At the base of each shaft is a circle of muscles which clasp the root of the quill when the animal is undisturbed but which relax their hold at the lightest touch.

The quill itself is much like that of a goose feather, with a pointed tip and numerous tiny barbs not unlike those of a fish-hook. If the quill enters the skin, the barbs not only make it very difficult to withdraw, but have a tendency to work their way deeper into the flesh. The quill can best be removed by "screwing" it out of the flesh, as this motion tends to flatten the barbs.

Porcupines are most abundant in the evergreen forests of North America where they feed on the tender inner bark, or cambium, of coniferous trees. This, of course, disfigures the tree, which if girdled, dies. In summer, porcupines feed in large measure on succulent herbs, especially on those growing near streams and lakes.

These rodents have an intense craving for salt and will gnaw anything which has even a trace of this substance, such as the handles of shovels or axes used by a person who has been perspiring.

The porcupine has a single young in April or May after a gestation period of about seven months. At birth it has tiny quills on its back.

Porcupine

INSECT-EATING MAMMALS

Although our native insect-eating mammals—the moles, shrews, and bats—are widely distributed in Canada and are common and often abundant in many areas, they are scarcely known to anyone except the professional zoologist. Almost everyone has seen bats flitting about at dusk, but relatively few have ever examined one closely and still fewer have any desire to do so! Most shrews are tiny animals that rarely enter houses. They are not often captured and brought home by domestic cats, as mice often are, so that even persons living in the country are not familiar with them. Yet at least one species is perhaps more abundant throughout most of southern Canada than any other single mammal!

Moles and Shrews

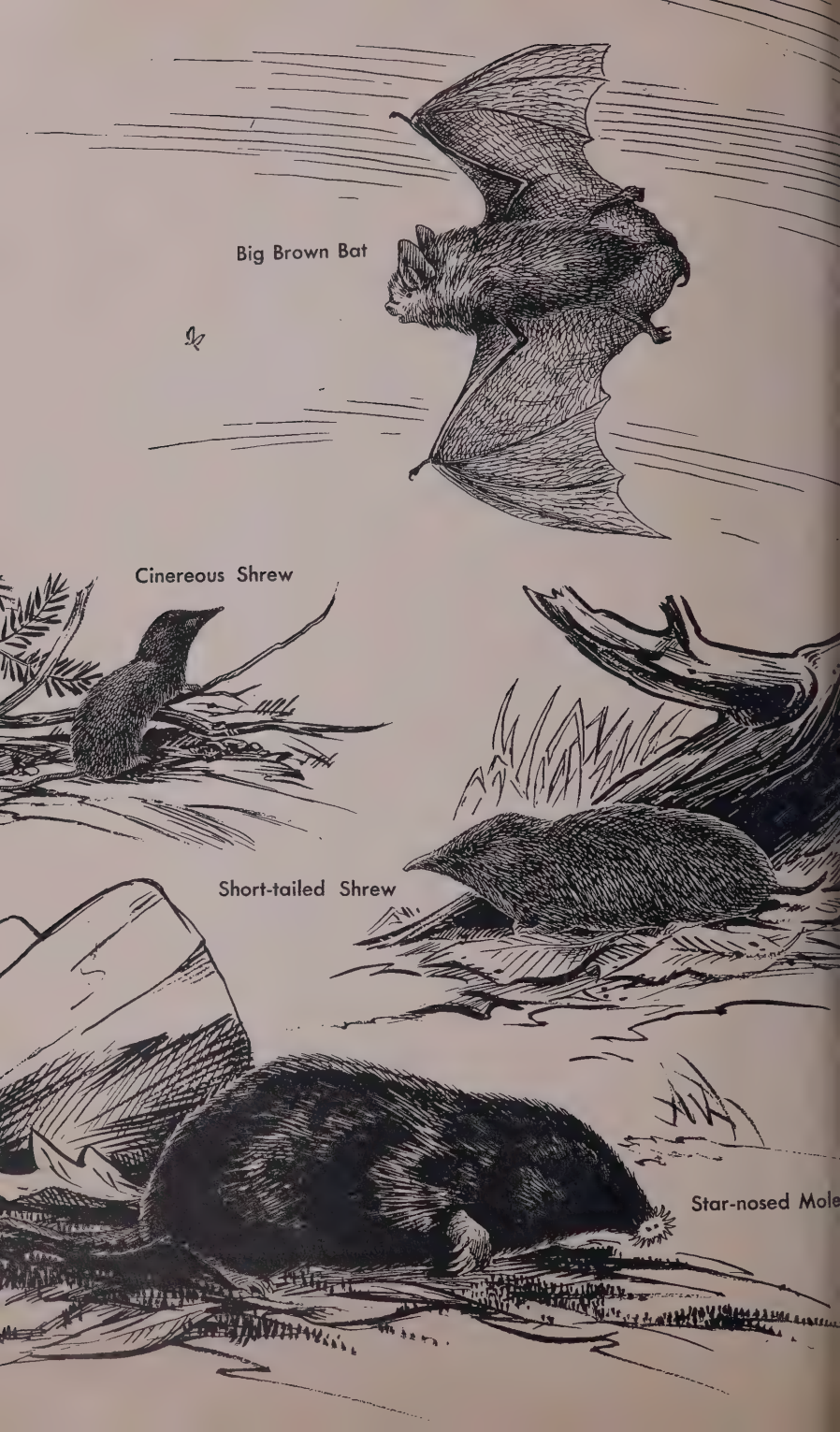
Shrews and moles are closely related, and were it not for the greatly enlarged front feet of the mole, it would be difficult at times for the average person to distinguish between certain moles and the larger shrews. Both animals have long pointed snouts; tiny, almost invisible eyes, and short, thick fur. They also are alike in having numerous sharp teeth, so helpful in capturing and chewing the insects on which they live.

The moles spend most of their lives excavating myriads of tunnels underground in search of worms and insects. Their nests are also underground, and here the young are born in a cozy chamber branching from one of the tunnels.

Shrews live in burrows too, but most of their time is spent seeking insects on the surface of the ground. All are small, ranging in size from the short-tailed shrew, which is about the size of a meadow mouse, to the pigmy shrew, which is probably the smallest mammal in the world and weighs less than a Canadian dime.

The short-tailed shrew possesses in its salivary glands an interesting feature, a poison potent enough to kill a mouse and to produce severe muscular pains in man.

Shrews are important economically because they destroy injurious insects. This is particularly true of the larch saw-fly which the shrews destroy by feeding on the pupae. The importance of shrews as insect-destroyers can be appreciated when it is realized that in one day they eat more than their weight in food.


Big Brown Bat
Cinereous Shrew
Short-tailed Shrew
Star-nosed Mole

Bats

Bats are the only mammals capable of true flight. The fore limbs, modified as wings, consist of greatly elongated fingers which serve as a framework for a very thin membrane. The hind legs and the tail are also connected by a membrane.

There are a large number of bat species distributed throughout the temperate and tropical parts of the world. They range in size from the tiny pipistrellis, which is about two inches long, to the giant "flying fox" of the East Indies, which has a wingspread of over four feet. They vary a great deal in colour too, from pure white to jet black, and pale yellow to reddish-brown and dark grey. Some are beautifully coloured, such as our native red bat, which is a bright rufous-red.

Although all Canadian bats are exclusively insect-eaters, there are tropical bats which feed on nectar, fruit, fish, and blood sucked from other warm-blooded animals. The vampires of South America are famous for their blood-sucking habits. These bats can alight on a sleeping person, make a circular incision a sixteenth of an inch deep and an eighth of an inch in diameter, and feed on the blood that oozes from the wound without disturbing the sleeper. Why the victim is not awakened by this surgical procedure has not been determined; possibly something in the saliva has anaesthetic properties. The danger of being bled by vampires lies not in the quantity of blood they ingest, but in the fact that the bats' saliva contains an anti-coagulating (non-clotting) substance and the wound continues to flow long after the bat has departed. These bats also carry dangerous diseases, such as rabies, which is much more serious than their blood-letting activities.

Until recently the navigating powers of bats was a mystery, as it is known that they can fly with ease in total darkness. Recent research has shown that while the bat is in flight it emits high-pitched sounds that bounce off surrounding objects. These echoes provide the bat with information regarding the location of objects with which it might collide and also probably the whereabouts of insects on which it feeds.

Some bats hibernate in caves or hollow trees during the winter; others migrate south to warmer climates. During hibernation, the bats are in a deep sleep, the pulse rate is very low, and breathing is reduced to a few inspirations a minute. Strangely enough, however, they can be quite readily awakened if disturbed.

Whales, Porpoises, and Dolphins

It is not surprising that whales were classed for a long time with the fishes, because externally they bear little resemblance to the familiar land mammals. Yet, despite their fish-like appearance, they have little in common with the fishes other than that both live in the sea.

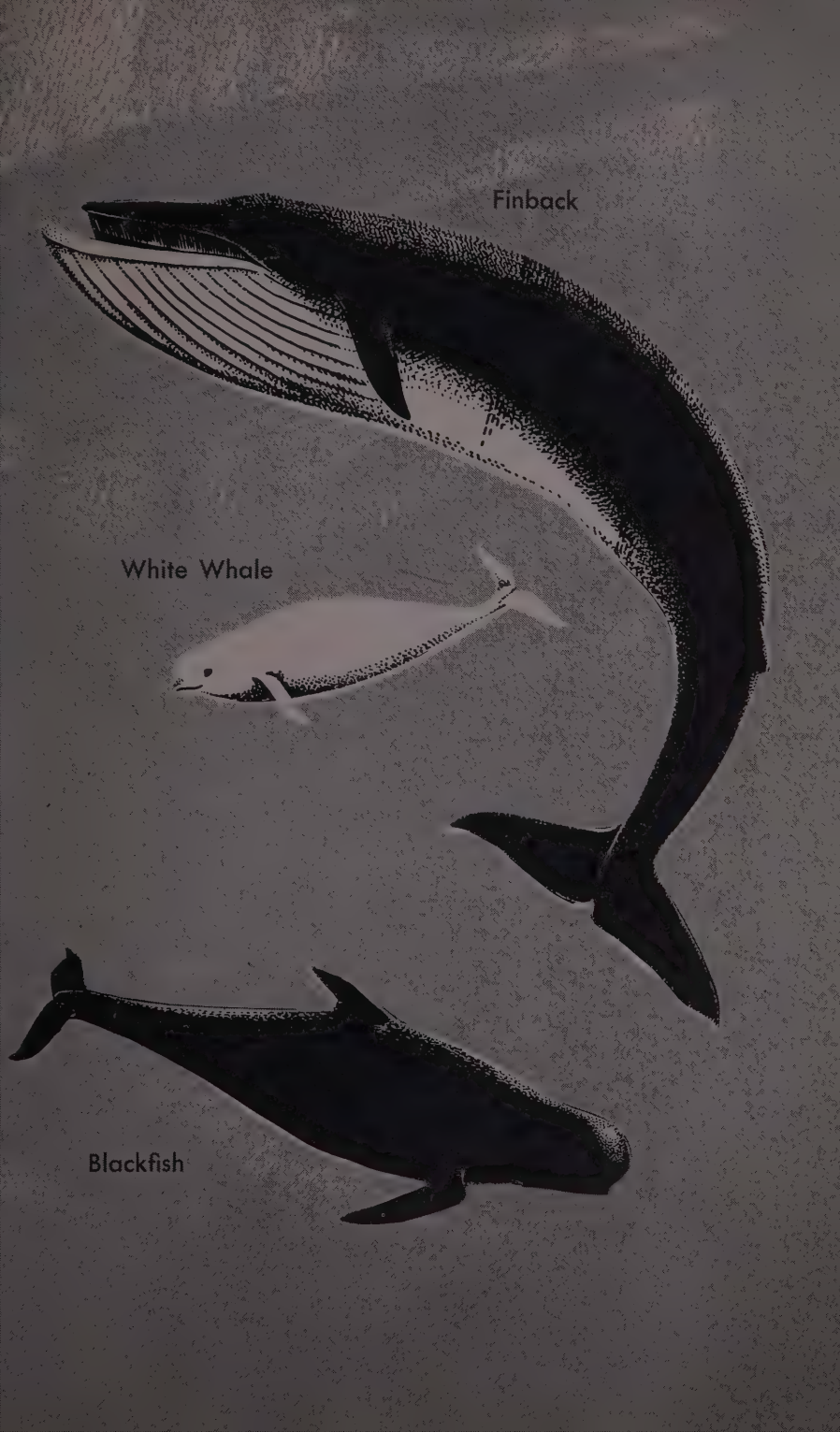
A look at the internal anatomy of the whale quickly reveals the similarity between its heart, lungs, intestines, and blood vessels and those of a land mammal like the horse or bear. The presence of a partition, the diaphragm, separating the heart and lungs from the stomach, liver, intestines, and kidneys, is reason in itself for classing the whale as a mammal, though there are many other similarities. Only mammals have a diaphragm.

Whales differ from other mammals in only a few minor respects which are peculiar to their way of life. For example, the hind limbs now consist of only a few rudimentary bones embedded in the flesh, while the tail which is a very large, well-developed structure with stiff fins or flukes, propels it through the water. Another difference concerns the system of breathing. In land mammals the nostrils lead to the throat, which in turn is connected with the upper end of the windpipe. In whales, the nasal passages lead directly to the windpipe and lungs. This enables the whale to breathe while food is being held in the mouth.

There are two groups of whales, the toothed and the toothless or baleen whales. The latter group have, instead of teeth, a fringe of stiff, brush-like structures hanging from the roof of the mouth. These toothless baleen whales live on small, shrimp-like animals extracted from the large quantities of water taken in while swimming. The mouth is then almost closed, and the water is forced out by the large tongue through the baleen, which acts as a strainer. The toothed whales feed largely on fish and squids.

Whales are the largest creatures that have ever lived. The blue whale may exceed more than 100 feet in length and weigh over 110 tons. The tongue alone weighs over three tons! Some of the porpoises and dolphins, of course, are quite small. The common porpoise rarely exceeds 6 feet in total length.

Whales reproduce like other mammals. When nursing her calf, the female rolls over on her side so that the two nipples are above


Finback
White Whale
Blackfish

the surface of the water. The gestation period is believed to be one year, and the baby blue whale is about 20 feet long at birth! It receives the utmost care from its mother, and whalers report that when a baby whale is harpooned or injured, the mother will put her flipper around it and help it to swim.

The smaller porpoises and dolphins generally travel in schools or, perhaps more correctly, herds. If a member of the group is wounded, two of the school will lift it to the surface from time to time so that it can breathe. In marine aquaria it has been found that they will do the same with wounded or sick animals of other species. One dolphin spent several days taking a small shark to the surface, presumably in the belief that it, like dolphins, required air from time to time!

The terms "porpoise" and "dolphin" are applied to the smaller toothed whales. There is no hard-and-fast rule on their usage, but small whales with pointed snouts or "beaks" are generally called dolphins.

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